Sales Figures

5,004 Commercial Machines Sold by 19 Manufacturers in December, 1935

Commercial sales for December, 1935, were reported to the National Electrical Manufacturers Association (Nema) by 19 companies, some of which are not members of the association. These reports cover the sale of units less than 1 hp. in size. Companies reporting are: Baker Ice Machine Co., Brunner Mfg. Co., Carbondale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Merchant & Evans Co., Norge Corp., Phoenix Ice Machine Co., Reliance Refrigerating Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

SALES FOR DECEMBER, 1935

COMMERCIAL	Domestic Quantity	Domestic Value	Canadian Quantity	Canadian Value	Other Foreign Quantity	Other Foreign Value
1. Water Coolers Complete	245	$ 23,306	2	$ 134	74	$ 7,912
2. Water Coolers Remote	27	1,693	2	103	2	222
3. Ice Cream Cabinets Complete	239	26,987	1	98	51	7,098
4. Ice Cream Cabinets Remote	95	12,561	1	165	16	2,404
5. Beverage Coolers Comp.	291	23,257	.....	.....	26	2,166
6. Beverage Coolers Remote	60	5,169	.....	.....	3	198
Condensing Units						
7. Less than ⅓ Hp.	449	24,921	6	405	1,010	58,047
8. ⅓ to ½ Hp. Inc.	1,291	103,254	20	1,756	744	66,453
9. Above ½ and Less Than 1 Hp.	443	51,350	8	1,103	104	13,244
10. Total Lines 7, 8, and 9	**2,183**	.....	**34**	.....	**1,858**	.....
11. Total Lines 1, 3, 5, 10	**2,958**	.....	**37**	.....	**2,009**	.....
12. Evaporators	2,335	61,085	59	2,567	358	10,251
13. Miscellaneous Cases and Cabinets	21	4,504	.....	.....	5	1,433
14. Total Commercial	.....	**$338,087**	.....	**$6,331**	.....	**$169,428**

Exports of Electric Refrigerators

November, 1935, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

	Electric Household Refrigerators Number	Electric Household Refrigerators Value	Electric Commercial Refrigerators Up to 1 Ton Number	Electric Commercial Refrigerators Up to 1 Ton Value	Parts for Electric Refrigerators Value
Austria	4	$ 366	4	$ 448	$ 860
Azores & Madeira Islands	4	340	...	...	...
Belgium	50	3,347	42	5,889	5,717
Czechoslovakia	...	...	...	...	1,834
Denmark	...	...	...	...	1,319
Finland	5	388	27	2,988	5,751
France	1,532	109,946	1,061	71,749	43,875
Germany	1	161	...	...	...
Gibraltar	...	...	...	...	109
Greece	119	12,073	1	151	88
Hungary	...	...	10	790	287
Irish Free State	...	...	...	...	613
Italy	24	1,776	...	...	4,491
Malta, Gozo & Cyprus	...	...	1	86	...
Netherlands	178	11,853	54	3,913	3,630
Norway	2	179	5	1,036	4,105
Portugal	4	510	...	...	1,037
Rumania	8	728	...	...	...
U.S.S.R. (Russia, Europe and Asia)	3	320	...	...	94
Spain	33	2,430	38	4,618	5,104
Sweden	53	3,635	4	421	9,005
Switzerland	1	63	...	...	8,443
United Kingdom	466	24,693	400	20,949	44,784
Yugoslavia	1	90	10	1,399	290
Canada	121	5,360	11	1,233	22,032
British Honduras	26	2,274	...	...	27
Costa Rica	21	1,603	...	...	101
Guatemala	16	1,602	1	151	248
Honduras	23	1,385	4	428	2,931
Nicaragua	2	194	1	189	4
Panama	184	9,718	12	2,112	2,812
Salvador	10	780	1	151	421
Mexico	171	17,581	29	4,514	3,752
Bermuda	12	1,198	3	419	616
Barbados	15	1,188	...	...	48
Jamaica	...	...	4	420	227
Trinidad & Tobago	33	2,855	...	...	233
Other British West Indies	25	2,483	1	850	955
Cuba	89	9,840	37	4,672	5,697
Dominican Republic	5	946	1	99	379
Netherland West Indies	137	13,350	10	1,779	612
French West Indies	6	491	2	428	124
Haiti, Republic of	37	4,228	...	...	230
Argentina	709	34,533	83	7,634	20,930
Bolivia	13	1,090	...	...	48
Brazil	1,231	105,747	120	14,778	9,925
Chile	59	4,818	16	3,161	383
Colombia	130	10,647	16	2,045	1,178
Ecuador	19	1,543	...	...	88
British Guiana	6	493	...	...	141
Surinam	...	...	...	...	91
Peru	116	11,416	3	272	663
Uruguay	68	4,979	59	6,024	5,696
Venezuela	145	12,462	4	404	734
Aden	15	1,392	...	...	...
Saudi Arabia	...	...	...	...	912
British India	221	17,632	16	3,828	3,443
British Malaya	65	4,683	2	210	868
Ceylon	25	1,894	...	...	242
China	56	3,392	20	1,686	1,581
Netherland India	13	839	9	999	1,490
French Indo-China	...	...	...	...	360
Hong Kong	17	1,560	...	...	3,256
Japan	5	514	17	2,084	2,324
Kwantung	...	...	...	...	10
Palestine	29	3,240	11	880	1,398
Philippine Islands	82	8,270	28	3,886	1,396
Siam	20	1,508	...	...	...
Syria	...	...	3	1,076	149
Turkey	9	1,070	2	239	1,265
Australia	681	46,895	8	1,256	34,781
British Oceania	2	177	...	...	...
French Oceania	3	616	...	...	92
New Zealand	751	59,043	57	6,949	4,355
Belgian Congo	26	2,777	3	444	...
British East Africa	18	1,294	...	...	258
Union of South Africa	4,479	353,666	125	12,930	49,739
Other British South Africa	53	3,922	...	...	716
Gold Coast	31	2,496	...	...	155
Nigeria	2	229	...	...	480
Other British West Africa	2	224	...	...	4
Egypt	17	1,612	...	...	1,376
Algeria & Tunisia	6	570	...	...	1,383
Madagascar	4	234	...	...	110
Other French Africa	47	3,967	...	...	107
Morocco	...	...	...	...	63
Mozambique	38	2,936	...	...	2,688
Canary Islands	...	...	1	69	460
Total	**12,634**	**$964,354**	**2,377**	**$202,736**	**$338,223**
Shipments to Hawaii	698	40,769	19	2,384	10,857
Puerto Rico	290	32,078	46	6,491	6,676
Virgin Islands	...	...	1	85	85

Pacific Utility Sales Show Large Increase

SAN FRANCISCO—Total sales of major electrical appliances made by the Pacific Gas & Electric during 1935 showed an increase of $4,500,000 over those made in 1934. With a 54 per cent gain, electric refrigeration led in building up this total.

Errors Made in Sales For Two States

In the report of sales by states during the year 1935 published in the last issue, two errors were made. The total for Louisiana should have been 13,786, instead of 13,796; and the total for Wisconsin should have been 24,122, instead of 23,822.

49,768 Household Refrigerators Sold in 1935 by Members Of Electrical Association of Philadelphia

Month	1935 Units Sold	1934 Units Sold	1933 Units Sold	1935 % Increase or Decrease Over 1934	1935 Retail Value	1934 Retail Value	1935 % Increase or Decrease Over 1934	1935 Average Price	1934 Average Price
January	718	1,069	1,033	— 33%	$ 137,558	$ 203,405	— 33%	$191	$190
February	2,634	1,329	1,107	+ 98%	488,499	247,586	+ 97%	185	186
March	6,357	3,363	2,072	+ 89%	1,115,435	628,204	+ 77%	175	186
April	6,652	8,290	4,621	— 20%	1,176,956	1,570,483	— 26%	177	189
May	7,885	8,754	7,973	— 10%	1,390,673	1,659,337	— 17%	176	189
June	5,936	6,738	11,399	— 12%	1,037,659	1,255,421	— 18%	175	186
July	6,290	4,775	4,553	+ 31%	1,147,967	929,799	+ 23%	182	194
August	4,035	2,683	4,384	+ 50%	754,558	526,199	+ 43%	187	196
September	2,730	1,593	2,823	+ 71%	542,075	325,361	+ 66%	198	204
October	2,330	1,767	1,968	+ 31%	426,495	369,840	+ 15%	183	209
November	1,839	1,002	840	+ 83%	342,874	198,836	+ 72%	186	198
December	2,362	1,085	1,081	+117%	481,826	259,280	+ 85%	204	238
Totals	**49,768**	**42,448**	**43,854**	+ 17%	**$9,042,575**	**$8,173,751**	+ 10%	**$181**	**$192**

Philadelphia Electric Co. Sells 4,263 Units during 1935

Month	1935 Units Sold	1934 Units Sold	1933 Units Sold	1935 % Increase or Decrease Over 1934	1935 Retail Value	1934 Retail Value	1935 % Increase or Decrease Over 1934	1935 Average Price	1934 Average Price
January	53	117	60	— 55%	$ 10,923	$ 26,042	— 58%	$206	$222
February	104	103	134	+ .9%	18,383	22,038	— 17%	176	214
March	302	231	142	+ 30%	57,386	47,374	+ 21%	190	205
April	566	726	394	— 23%	105,182	144,457	— 28%	186	198
May	719	795	652	— 10%	130,465	159,536	— 19%	181	200
June	715	589	948	+ 21%	134,389	125,521	+ 7%	188	213
July	685	554	668	+ 23%	133,640	118,355	+ 12%	195	213
August	513	353	657	+ 45%	102,322	76,551	+ 33%	199	216
September	263	184	461	+ 43%	52,649	37,928	+ 38%	200	209
October	122	96	231	+ 27%	26,703	23,895	+ 12%	218	248
November	113	91	47	+ 24%	23,888	20,555	+ 16%	211	225
December	108	95	139	+ 13%	22,483	20,881	+ 7%	208	219
Totals	**4,263**	**3,934**	**4,533**	+ 8%	**$ 818,413**	**$ 823,133**	— 1%	**$192**	**$209**

Note: Utility sales approximate 8.6% of total sales.
Report covers sales in Philadelphia, Bucks, Montgomery, Delaware, and Chester Counties.
Report includes sales of the following makes: Atwater Kent, Apex, Coldspot, Crosley, G-E, Gibson, Grunow, Frigidaire, Hotpoint, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, and Westinghouse.

* * *

23,031 Units Sold in 1935 by Commercial Refrigerator Industry

	Refrigerated Display Cases	Sectional Coolers	Commercial Refrigerators	Total
January	697	144	243	1,084
February	984	133	310	1,427
March	1,372	253	513	2,148
April	1,474	258	404	2,136
May	1,667	201	410	2,288
June	1,543	227	353	2,123
July	1,620	217	385	2,222
August	1,589	240	345	2,174
September	1,299	222	251	1,772
October	1,516	226	348	2,090
November	1,408	252	247	1,907
December	1,270	209	201	1,680
Totals	**16,439**	**2,582**	**4,010**	**23,031**

Increase in Fall Selling Pushes Household Appliance Sales to New Record

NEW YORK CITY — Household products manufacturers, as a group, transacted a larger volume of business in 1935 than in any year since the beginning of the depression, with sales in many lines establishing new peaks, according to the current Household Products and Supplies section of *Standard Trade and Securities*, a publication of Standard Statistics Co., Inc.

Significant, moreover, is the fact that gains over 1934 were scored principally in the last half of the year, the publication states. While this trend reflected primarily the rising level of general business activity, more aggressive advertising and promotional campaigns contributed to the higher-than-seasonal level of sales.

To a lesser extent, the easier credit terms and financial assistance provided by federal agencies afforded additional sales stimuli.

All factors point to a further marked expansion of volume in 1936, the bulletin adds. In addition to an important replacement demand, which should become more effective as consumer purchasing power improves further, indicated cyclical gains in the building and renovation of homes should be of decided benefit to household products suppliers.

Evidencing their confidence in the future, practically all manufacturers have scheduled larger sales and advertising budgets for 1936, and have improved and expanded their lines, the publication states.

With the exception of essential advances in certain lines, selling prices during 1935 remained close to 1934 levels; and since both production costs and selling and advertising expenses were larger, earning gains failed to keep pace with sales increases. However, the larger volumes are believed to have permitted the most satisfactory aggregate results since 1929.

Although prices for 1936 lines remain generally unchanged, a few modest advances have been announced, and further mark-ups are possible as the season progresses, it is stated. In addition, the outlook for the price structure is rendered favorable by the fact that dealer inventories were sharply depleted by active retail demand during the closing months of 1935. No large unsold stocks of old lines are now overhanging the market, as was the case in a number of instances at the beginning of last year.

This factor, coupled with the prospect of an active demand, points to substantially improved results for most household products concerns during the first half of 1936, the publication forecasts.

Sales of household electric refrigerators for 1935, estimated at 1,700,000 units, are some 22 per cent above the 1,390,600 units sold in 1934, the previous peak year. The much higher than seasonal level of sales in the latter part of the year, which made possible such a favorable showing, permitted a virtual clean-up of old models, it is stated.

Hence, says the bulletin, the outlook is for a firm price structure and a satisfactory sales stimulus from new and improved lines.

Two companies manufacturing refrigerators are mentioned in the "Outlook for Household Products Stocks" section of the publication: Kelvinator Corp. and Servel, Inc.; and two ice companies: American Ice Co. and City Ice & Fuel.

Of Kelvinator, the publication says: "Sales continued above year-earlier levels in the first quarter of the current fiscal year, notwithstanding the fact that shipments did not include new models, as was the case in the closing part of 1934. With new stocks of old models thus sharply depleted, the new and improved 1936 lines should stimulate sales markedly. Additional extra dividends, or an increase in the regular rate, are in prospect."

Servel: "Operations remained well above seasonal levels in the closing months of 1935, and sales of Electrolux models for the full calendar year exceeded 1934 volumes by 56 per cent. With stocks of old models largely liquidated, the company is favorably situated to benefit from the expected spring upturn in demand. Thus, the marked earnings betterment registered in the past fiscal period (when net advanced to $1.16 a share from $0.27 in the preceding 12 months) should be extended in the current year. Larger dividend disbursements are likely."

Staehle Is District Head

DALLAS—Fred Staehle, formerly commercial manager of Electrical Household Appliance, Inc., General Electric distributor here, has been appointed manager of the distributorship's South Texas district, with headquarters in San Antonio.

'35 Domestic Sales For Philadelphia Total 49,768

PHILADELPHIA—Household electric refrigerators sold in this metropolitan area by members of the Electrical Association of Philadelphia during 1935 reached a total of 49,768 units, a new all-time record for this city, reports George R. Conover, managing director of the Association.

This represents an increase of 17 per cent in unit sales over 1934. Dollar volume of 1935 sales was $9,042,575.

Average unit retail price of refrigerators sold in this area in 1935 dropped to $181 from the 1934 average price of $192.

Smashing gains were registered in all three months of the final quarter of the year, culminating in December, when the increase over the same month in 1934 was 117 per cent, biggest gain for any month of 1935.

Average price of refrigerators sold in December was $204, highest average price during any month in 1935, indicating that higher-priced refrigerators are apparently purchased for Christmas gift purchases.

A separate tabulation of the sales of electric refrigerators made by the Philadelphia Electric Co., local utility, shows that this power company sold 4,263 units during 1935, an increase of 8 per cent over its 1934 sales.

Sales by the power company were approximately 8.5 per cent of the total sales made by members of the Association.

The report covers retail sales of household electric refrigerators in Philadelphia, Bucks, Montgomery, Delaware, and Chester counties. Makes of refrigerators covered in the sales report include: Apex, Atwater-Kent, Coldspot, Crosley, General Electric, Gibson, Grunow, Frigidaire, Hotpoint, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, and Westinghouse.

Commercial Case Makers Report 1935 Sales

(*Concluded from Page 1, Column 1*)

38 per cent better than the total of $577,828.87 reported in December, 1934.

In point of number, sales during May reached the peak for the year, totaling 2,288 units. Close behind was July, with a 2,222 total, and August ranked third, with sales of 2,174 units.

Low month for the year was January, with 1,084 sales; February, with 1,427 sales, was next; and December, with 1,680, was third.

Sales of refrigerated display cases reached their highest total in May, when association members reported sales of 1,667 units. July, with 1,620 sales, was a close second.

April, March, and November ranked in one-two-three order in sales of sectional coolers, with only a slight margin separating them. April sales were 258 units, March, 253, and November, 252.

March was by far the best month for sales of commercial refrigerators, its reported total of 513 being well ahead of those for any other month. Sales of 410 units, however, were reported during May, and of 404 in April.

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Sparton Adopts 5-Year Service Warranty Plan

Additional Protection May Be Purchased for $5 By Buyer

JACKSON, Mich.—A five-year service warranty bond, obtainable at a cost of $5 added to the list price, will be offered buyers of Sparton electric refrigerators this year in addition to the company's regular one-year guarantee, according to an announcement this week by Harry G. Sparks, general manager of Sparks-Withington Co.

The warranty plan is optional, and is available on all the company's 1936 models, Mr. Sparks said. Purchasers who may not wish to take advantage of it will still be covered by Sparton's regular one-year guarantee.

Mayflower Unit to Be Marketed by Hunt & Geiler

LIMA, Ohio—Manufacture and distribution of Mayflower household electric refrigerators is once again in the hands of the two men who founded the company which manufactured the original Mayflower unit—Harry J. Hunt and Fred C. Geiler.

These two men, who are respectively president, and secretary-treasurer of the new company—Mayflower, Inc.—have just announced that the new firm is in production on a complete line of household electric refrigerators. Manufacture of the Mayflowers will be carried out at a new plant here.

Assets of the original concern, which was known as the Trupar Mfg. Co., were purchased in 1934 by Dallas Winslow, Inc., of Detroit (parent company of Copeland Refrigeration Corp.).

Messrs. Hunt and Geiler, however, have purchased from the Winslow company the right to use the name Mayflower, and the jigs, patterns, and dies for the manufacture of the Mayflower household compressor.

According to Mr. Hunt, many of the old-time Mayflower distributors are now in the distributing line-up of the new concern.

Mr. Hunt has had considerable manufacturing experience, having been connected with the National Cash Register Co. and the Duro Pump Co., before founding the Trupar Mfg. Co.

Mr. Geiler is a pioneer electric refrigeration engineer, having been connected with the industry practically ever since its inception.

50 'Toppers' Convene in Southwestern District

NEW ORLEANS — Approximately 50 high-ranking salesmen met at the Roosevelt Hotel here recently in the first regional convention of the General Electric "Toppers" from the southwestern district.

Joe Williamson of Henderson, Tex., and L. D. Peper of Greenwood, Miss., who had the best records, were awarded watches and made members of the "Topper directorate."

After the opening session at which the delegates received their pins, and heard brief addresses by the executives, the convention was social.

The southwestern district is under the management of J. G. Gamis. G-E executives who attended from Nela Park included J. DeJen, director of the Toppers; E. J. Geddes, club secretary; Ralph Cameron, assistant general sales manager of the specialty appliance department; and J. A. Moore, accountant.

Ralph Keating of Crosley Dies in Atlanta Hospital

ATLANTA, Ga.—Ralph L. Keating, Crosley district manager in Georgia and the Carolinas, died Feb. 8 at the Georgia Baptist Hospital following an emergency operation for appendicitis.

Although his connection with Crosley only began in April, 1934, he had previously had many years' experience in the refrigeration and radio field.

Burial took place in Creston, Iowa. Mr. Keating leaves a wife and son.

Spahr Will Manage Delco-Frigidaire Eastern Sales

NEW YORK CITY—Appointment of D. G. Spahr as manager for the newly established eastern division general office of Delco-Frigidaire Conditioning Corp. here was reported recently by James J. Nance, vice president and general sales manager of the corporation.

The new office, which will be located at 35 West 45th St., will have jurisdiction over Delco-Frigidaire activities in eastern states.

Mr. Spahr was formerly sales manager for Delco Appliance Corp., Rochester, N. Y. General Motors recently merged the automatic heating equipment sales of this company with the summer air-conditioning product sales activities of Frigidaire, forming the Delco-Frigidaire Conditioning Corp.

Associated with Mr. Spahr as assistant manager will be L. W. Curl, who has been assistant air-conditioning sales manager for Frigidaire Corp.

53 Companies Assist In Kitchen Program

NEW YORK CITY — Fifty-three member companies of National Electrical Manufacturers Association have signed pledges as participants in the Kitchen Modernization Program which the association is sponsoring jointly with Edison Electric Institute, Nema headquarters here reports.

Organizations in the household appliance field which have signed pledge forms include Akron Porcelain Co.; Belden Mfg. Co.; Bryant Electric Co.; Century Electric Co.; Crosley Radio Corp.; Cutler-Hammer, Inc.; Edison General Electric Appliance Co., Inc.; Electromaster, Inc.; Emerson Electric Mfg. Co.; Frigidaire Corp.; General Electric Co.; Gibson Electric Refrigerator Co.; Landers, Frary & Clark; Leonard Refrigerator Co.; Kelvinator Corp.; Knapp-Monarch Co.; New Jersey Porcelain Co.; Norge Corp.; Potter Refrigerator Corp.; Sparks-Withington Co.; Square D Co. (Calif.); Star Porcelain Co.; Sunbeam Electric Mfg. Co.; and Westinghouse Electric & Mfg. Co.

Hulett Made Asst. Mgr. of G-E Commercial Sales

CLEVELAND — Appointment of Harold Hulett as assistant manager of commercial refrigeration for the appliance and merchandise division of General Electric Co., and Frank Corliss as manager of national user sales for commercial refrigeration, was announced recently by Walter E. Landmesser, commercial refrigeration manager.

Landmesser and Hulett are conducting a series of commercial refrigeration sales meetings in Birmingham; Atlanta; Springfield, Mass.; Providence, R. I.; and Augusta, Me.

1,460 Counter Freezers Sold During 1935

CHICAGO—Sales of counter freezers during 1935, as reported by members of the Counter Freezer Association, totaled 1,460 units, with a dollar volume of $1,493,072.23, according to C. S. Clark, secretary-treasurer of the association.

California - - Here We Come!

During 1935, California nearly doubled its sales of household electric refrigerators, compared with 1934, and thereby led all states of the Union in the percentage of increase over the previous year.

Therefore, Editor George Taubeneck made three stops in California on his around-the-world trip to interview distributors in San Diego, Los Angeles, and San Francisco and see what he could find out to explain this phenomenal record.

Then Robert P. Nixon, assistant business manager of the News, who accompanied the editor to California, stayed a couple of weeks longer to visit manufacturers and jobbers and bring back additional information regarding Pacific Coast activities.

He was followed by James J. Murray, contributing editor of the News, who has driven on up through California to Oregon and Washington and will soon return over the same route, reporting on industry conditions with special reference to air conditioning.

The results of these investigations by members of the Detroit staff will be reflected in the next four issues of the News. Next week (Feb. 26), the re-opening of the San Diego Exposition will be featured, with many interesting pictures of the Fair and the editor's interpretation of the refrigeration situation in San Diego.

The following issues (March 4, 11, and 18) will carry reports and pictures from Los Angeles and San Francisco. So, look out California! Having been there in person, we are now coming back in print.

24,383 Units Sold in Cleveland in 1935

CLEVELAND—A total of 24,383 electric refrigerators were sold in Cleveland and the whole of Cuyahoga County during 1935 by distributors, reports Ralph H. Jones, secretary of the Electrical League of Cleveland.

This is an increase of 4.4 per cent over sales for 1934, which totaled 23,353 units.

December sales in Cuyahoga County totaled 1,141 units, a decline of 4 per cent from the 1,189 sold in December, 1934.

Grunow Tells Plans To Distributors

CHICAGO—Distributors of Grunow electric refrigerators and radios from all parts of the country heard a complete explanation of General Household Utilities Co.'s reorganization and production plans and an outline of the company's sales, advertising, and sales promotion program during their recent meeting here.

President William C. Grunow explained the reorganization and production plans to distributors, after which H. J. Shartle, general sales manager, introduced and explained the 1936 line of Grunow refrigerators, and the merchandising plan back of them. Advertising and sales promotion plans for the year were outlined by J. H. Rasmussen, advertising manager.

New distributors who attended the meeting included M & M Co., Cleveland; Ridge Motor Supply Co., South Bend, Ind.; Lappin Electric Co., Milwaukee; and Ignition Service & Supply Co., Albany, N. Y.

Leonard Names Beaucaire Rochester Distributor

ROCHESTER, N. Y.—Beaucaire, Inc., here, was recently appointed distributor for Leonard refrigerators in this territory.

Monroe, Wayne, Livingston, Ontario, Yates, Schuyler, and Steuben counties are included in the Beaucaire territory.

Faulty Credit Reports Blamed For Detroit FHA Situation

First Bancredit Official Says Problem Is A Local One

By Phil B. Redeker

DETROIT—Investigations into the causes of complaints by consumers here who claim to have been victims of "high pressure" and misleading selling methods in buying FHA-financed appliances, seem to point to faulty credit information as a principal cause of the trouble.

As Federal and local officials, and the staffs of institutions loaning money under the FHA program, dug into the situation last week following a condemnation of selling methods by Judge Joseph A. Gillis of the Common Pleas Court which was quickly followed up by the local press and the Better Business Bureau (see story on page 1 of the Feb. 12 issue of ELECTRIC REFRIGERATION NEWS), the problem was revealed to have two phases:

(1) Consumer complaints alleging unsatisfactory operation of a considerable number of oil burning heaters, on which the purchaser could get no service.

(2) Complaints from purchasers of all types of appliances, on the grounds that they had been "high pressured" into buying equipment they couldn't

(*Concluded on Page 20, Column 1*)

Hotpoint Line for 1936 Includes 3 Designs

CLEVELAND—The Hotpoint refrigerator division's share of General Electric Co.'s 1936 line of electric refrigerators is made up of 12 models, which include the standard, deluxe, and thriftype series.

Distinctive in styling, the deluxe models have a V-type or "prow-shaped" door. Cabinets have Glyptal-baked enamel, or all-porcelain finish. Features of the new models include sliding shelves, temperature control and defroster, foot pedal door opener, stainless steel super-freezer, and interior light.

Added accessories to be found in some of the models are: aluminum frozen-dessert trays, flexible-rubber ice trays, ice-tray remover, vegetable pan, vegetable bin and drawer, and glass refrigerator dishes.

Coincident with the introduction of the new line, Hotpoint division officials outlined the advertising and promotional plans for 1936. Highlights in the advertising schedule will be full-page insertions in *The Saturday Evening Post* and other national magazines. Copy will also be placed

(*Concluded on Page 20, Column 2*)

Hotpoint Starts Series Of Dealer Meetings

CLEVELAND—Swinging the 1936 merchandising program of the Hotpoint refrigerator division of the General Electric Co. into action, a series of sales meetings for distributors from Detroit, Buffalo, Cleveland, Pittsburgh, and Cincinnati territories were staged at Nela Park here recently by Erle F. Morford, Great Lakes district manager of this G-E division.

In addition to this activity, dealer showings have been held in Cincinnati, Louisville, and Dayton. Despite sub-zero weather, these meetings have been well attended, and a large number of orders have been booked, Mr. Morford states.

Sales of Hotpoint refrigerators in the metropolitan New York territory during the month of December were approximately 300 per cent higher than those made in the same period of 1934, reports Mr. Morford, who has recently spent two weeks contacting dealers in this territory.

G-E Supply to Handle Appliances in Tenn.

MEMPHIS, Tenn.—General Electric Supply Corp., 16 South Lauderdale St. here, will in the future serve as distributor for G-E products in the entire tri-state territory, reports H. A. Pendergraph, district manager of the organization.

The firm has recently acquired the assets of Tennessee Appliances, Inc., former distributor. B. M. Raborn, former manager for Tennessee Appliances, will manage the Memphis offices of the General Electric Supply Corp.

Retail business of the old concern will be handled by Wallace E. Johnston, who purchased that end of the business and has opened show rooms at Union Ave. and South Manassas.

F-M Appoints Air-Ola Distributor in W. Va.

CHICAGO—Appointment of Air Ola Radio Co., Huntington, West Virginia and Benton Bailey Co., Inc., Richmond, Va., as distributors of Fairbanks-Morse electric refrigerators and other home appliances was announced by company officials here recently.

Air Ola Radio Co., will distribute F-M products in southern West Virginia and in the eastern part of Kentucky.

Territory to be covered by Benton-Bailey Co., Inc., includes the state of Virginia and several counties in North Carolina.

Sale of TVA Power Upheld by Court

WASHINGTON, D. C., Feb. 17—The United States Supreme Court today held that the Federal government may build dams for national defense or navigation control, and that it may sell electricity generated by such dams, thereby making the Tennessee Valley Authority a valid institution.

The 8-to-1 verdict (Justice McReynolds dissenting) was read by Chief Justice Hughes, who warned, however, that: "we limit the decision to the case before us, as we have defined it."

The case was to decide whether or not the TVA could purchase transmission lines from the Alabama Power Co., and whether it could sell surplus energy to the Alabama company.

The court did not rule on the validity of such TVA activities as the encouragement of the wider use of electric power through such an agency as the Electric Home & Farm Authority.

The court, however, did refuse to grant a "declaratory decree" sought by stockholders of the Alabama Power Co., to enjoin the government from future activity in competition with private power companies as the result of dams now under construction or to be built.

Georgia Power Co. Unit Sales Show Decrease

ATLANTA — Electric refrigerator sales reported by the Georgia Power Co. for 1935 show a slight decrease when compared with the sales figures for 1934, unit sales in 1935 totaling 9,396, as against 10,428 in the previous year.

Contrasted with this decrease, the electric range unit sales totaled 4,183 in 1935 as against 3,373 the preceding year. Dollar volume of all electric and gas appliances sold by this company during 1935 was $2,983,262.42—which figure shows a gain of 15.6 per cent over the 1934 sales total of $2,579,142.18.

Quota for 1936 is set at $2,500,000 and includes sale of 8,200 refrigerators, 5,400 ranges, 3,000 water heaters, and 390,000 Mazda lamps.

Arnold Wholesale to Handle Leonard & Zenith Lines

CLEVELAND — Arnold Wholesale, Inc., Detroit Ave. at West 54th St., has been appointed distributor for Leonard refrigerators and Zenith radios in this territory.

Walter Custis, former sales manager of the Arnold Co., is now vice president, and his previous post is being filled by Art Ridgely.

Larger Orders Made By Crosley Dealers

CINCINNATI—One hundred to 300 per cent increases in orders from distributing organizations over other years were reported by Howard E. Richardson, general sales manager for Crosley Radio Corp., upon returning here from a series of dealer meetings.

In Chicago, Mr. Richardson presented the entire Crosley line—refrigerators, radios, washers and ironers—to buyers attending the merchandise mart. In Philadelphia, he showed the line to heads of all department stores at a luncheon and showing given by Pierce Phelps Co., Crosley distributor in that city.

Carolina Auto Supply House, distributor at Charlotte, N. C., held its dealer meeting at the Hotel Charlotte. A banquet and floor show entertained the 200 dealers who attended.

An open-house meeting at the Penobscot Exchange Hotel, Bangor, Me., was used to introduce the 1936 line by Talbot, Brooks & Ayer Co., Portland, distributor for Maine and northern New Hampshire.

Arthur Talbot, general manager of the Portland company, was in charge, assisted by W. H. Buck, sales representative in central Maine. Other sales representatives attending were Paul Smith and Morris Hodgkins. H. D. Schumacher, Crosley district manager, was also present.

Banqueting and "Shelvador parodies" on popular songs were used to entertain 100 dealers after they had seen the new line presented by Western Supply Co., Salt Lake City distributor.

Graybar Electric Co., San Antonio, Tex., was host to approximately 200 guests at its showing. C. R. Hull, merchandise manager for the distributor, was master of ceremonies, and Harry Roper, Crosley district manager, presented the new models.

In spite of the 33.5° below zero weather, central Minnesota and the twin cities yielded 200 dealers to attend the showing by Motor Power Equipment Co., St. Paul, in the Nicollet Hotel, Minneapolis. Frank Hutchinson, of the distributing company, was assisted in his arrangements by H. F. Jaax, Crosley district manager.

Frankelite Co., Crosley distributor, held the first of three meetings at the Carter Hotel, Cleveland. The remaining two will be held at Mansfield and Youngstown.

A two-day meeting replaced the usual single-day session for the Ontario Electric Co., Buffalo distributor. Instead of presenting the new line to the dealers at a general meeting, a two-day open house was held, which gave the company representatives an opportunity to talk to each dealer personally, George G. Eckel reports.

Approximately 240 Crosley radio and refrigerator dealers met in "open house meetings" in Ft. Worth, conducted by the host, Shield Co., Crosley distributor for north central and west Texas, the Texas panhandle region, and southern New Mexico here.

No set speeches or scheduled entertainment was offered; the business conferences were conducted in question and answer style with a large percentage of those present taking part in the round-table discussions on sales methods and dealer service.

H. L. Roper, Crosley factory representative, conducted the business sessions, and C. B. Savage and W. W. Slaughter, president and sales manager respectively of the Shield Co., were in charge of arrangements. The company has branch houses at Amarillo and El Paso, Tex.

Receiving special mention at the convention were the salesmen who won the diamond-studded pin for selling 25 Shelvadors in one month, thus qualifying in the 100 Per Cent Club. The Hilliard Furniture Co., Fort Worth, had four men qualifying for the club, and the Central Drug Store, Wink, Tex., was represented by three club members.

Dealers at the convention acclaimed the credit plan made possible by the Federal Housing Administration as a leading factor in the 1935 sales upturn.

Crosley Demonstrates the Shelvador

President Powel Crosley, Jr., on a quail hunting trip to Nashville, goes over the 1936 Shelvador line with W. W. Gambill, Jr., Nashville distributor; Damon Headdes, state director of conservation; and Walter Evans, president of Castner Knott Co., department store.

2 Gibson Distributors Named in Penn.

GREENVILLE, Mich.—Gibson Electric Refrigerator Corp. has appointed M. A. Hartley and Co., 101 Carlisle St., Gettysberg, Pa., and Knerr, Inc., 1008 Third St., Harrisburg, Pa., as distributors of the Gibson line.

Sales Manager R. Z. Oyler will be in charge of York, Adams, Franklin, and Cumberland counties in Pennsylvania and Carrol, Frederick, and Washington counties in Maryland, in the M. A. Hartley Co. territory.

Knerr, Inc., will represent Gibson in 13 counties in central Pennsylvania.

Kelvinator Gets Contract For Housing Project

DETROIT — Kelvinator Corp. has been awarded a contract for the installation of 1,278 Kelvinator household electric refrigerators in two Atlanta, Ga., projects of the Federal Public Works Administration, division of housing.

The contract calls for the installation of the new 1936 Kelvinators, model K4-36, having a net cubic capacity of 4.15 cubic feet. Six hundred and three units are for the Techwood project and 675 for the University project.

Joint Presentation of Lines Considered by Wisconsin Group

MILWAUKEE — Distributors of electrical appliances may substitute a joint showing of refrigerators and other merchandise for the expensive and time-consuming private dealer showings formerly held, if a plan suggested at the February meeting of Wisconsin Radio, Refrigeration & Appliance Association is adopted.

Support of the movement, reported by President Frank W. Greusel, was voted by the association's board of directors, and the hope expressed that distributors might be able to work out a satisfactory plan.

In reviewing the outstanding appliance developments of the month, Mr. Greusel made particular mention of a suggestion by W. H. Roth, vice president of Radio Specialty Co., regarding trade-in practices, and urged other dealers to follow the plan.

Mr. Roth had suggested to his dealers that, when they were told by a prospect of an unusually high trade-in allowance or good price offered by a competitor, they phone the dealer direct and get the facts. Often, he added, such offers are created in the minds of smart buyers.

Annual meeting of the association will be held March 4 in the Knickerbocker hotel, at which officers and directors will be elected. Nominating committee, named by Mr. Greusel, includes Carl Hayssen, Northwestern Acceptance Co., chairman; E. F. Schefft, Schefft's, Inc.; and Bert R. Johnson, Westinghouse Electric Supply Co.

Tampary Will Distribute York Products in Florida

PENSACOLA, Fla.—C. P. Tampary Construction Co. here has been appointed distributor for York Ice Machinery Corp. in this territory. The company is represented by T. C. Tampary, and T. H. Stavros.

Better Promotion of Electrical Service Planned by Nema

NEW YORK CITY—Plans for more comprehensive market promotion of electrical service and supplies were presented at the general meeting of the National Electrical Manufacturers Association held at the Waldorf Astoria hotel here recently.

Keeping architects and builders informed on electrical matters, cooperation with Electrical Leagues, cooperation with electrical maintenance engineering groups, and the promotion of adequate wiring were included among the general activities planned for the new committee which was formed at the organization's spring meeting in Hot Springs, Va.

Architects and builders will receive information in an acceptable form concerning the utilization of electrical products through the Producers' Council, in which Nema has recently taken membership, reported C. E. Swartzbaugh, chairman of the Nema business development committee.

Details of the organization of the International Association of Electrical Leagues which was launched in Washington on Jan. 18, and which is expected to effectively replace the former Electrical League Council as an agency for cooperative market development, were described to the meeting.

Toward the preparation of an adequate wiring plan, Nema has appointed a preliminary planning committee. Attempts will be made to develop some industry plan designed to impress upon the public the necessity for adequate wiring which will permit satisfactory lighting, and provide for the utilization of electrical equipment needed by the occupants of homes, stores, office buildings, factories, and institutions.

Among the business development activities, Mr. Swartzbaugh drew attention to the National Kitchen Modernizing program, sponsored by Edison Electric Institute and Nema. He said that hundreds of communities are already planning to participate in the program by local electrical interests under the leadership of local electrical utilities.

Similar to the electric table cookery program which terminated last year in "National Electrical Housewares Week," a program of market development will be conducted again this year by manufacturers of domestic electrical appliances.

A new type of organization within Nema which will facilitate coordination of various activities and permit maximum results, has been developed by the business development committee.

It will consist of a number of bureaus, each one of which will deal with a certain market. At the outset, six such bureaus have been decided upon: residential, commercial, industrial, utility, farm, and governmental.

By a system of sub-division, manufacturers of products in each field will be invited to be active in those sections from which they expect business. For program purposes, the residential field will be divided into: kitchen, living quarters, house grounds, and basement.

G-E Dealer Sells 11% Of Market in 8 Years

MARTINSVILLE, Va.—During the eight-year period that it has been handling General Electric refrigerators, the Henry County Furniture Co. has sold electric refrigerators to more than 11 per cent of the electric meter users in this territory, company officials claim.

The dealer had sold an average of 30 refrigerators a year up to 1935, when 30 units were sold during the first four and a half months.

Promotional methods that have helped build sales for this dealership include newspaper, direct mail, and outdoor advertising, use of the distributor's sales pilot coach, and cooking schools.

In a recent campaign to boost range sales, the company sponsored a three-day cooking school. Approximately 200 women were present at each session.

Waukesha Makes DeLong General Manager

WAUKESHA, Wis.—James E. De Long, executive vice president of the Waukesha Motor Co., manufacturer of gasoline-operated refrigerators, has been appointed general manager.

Mr. De Long has been connected with this company for 13 years, having joined the organization in 1923 as field engineer in charge of oil industry operations.

Mr. De Long will continue to head this company's executive board. Other members of the board include J. B. Fisher, chief engineer; C. P. Ross, assistant secretary and treasurer; J. G. Swain, sales manager; and A. S. Cronk, director of purchases.

Connecticut Dealers Make Changes for 1936 Sales Drive

HARTFORD, Conn.—Complete redecoration, expansion, changes of location, and the inclusion of a model electric kitchen are some of the improvements which have been made by appliance retailers in this territory recently in preparation for 1936 campaigns.

G. Fox & Co. here, one of the state's largest department stores, has installed a General Electric model kitchen as a permanent display and has devoted large floor space to refrigerators and other appliances.

The change was made when the store was named an independent dealer for G-E. Other lines carried include Hotpoint and Universal. J. E. Forryan as sales manager directs the work of 15 outside salesmen, and Frank Cashman is department buyer.

Androphy Electric Co., 68-70 Main St., Ansonia, Conn., has doubled its floor space by taking over an adjoining store, and has completely remodeled and redecorated. Julius and Abe Androphy operate the store, and handle Norge and Fairbanks-Morse refrigerators, and other major appliances.

Another store which recently underwent extensive remodeling is the Hanover-Curland Co., Franklin and Bath Sts., Norwich, owned by Abraham Curland and Max Hanover. Display space for refrigerator lines has been greatly increased.

Samuel Elovitz, operating Hub Radio Store, Inc. appliance firm with headquarters at 232 Asylum St., Hartford, has opened a branch outlet at 286 Main St., New Britain, and moved his Middletown branch from 646 Main St. to 286 Main St.

Veillette and Despins, Meriden appliance firm handling Crosley and Grunow refrigerators, has moved its store from Park and State Sts. to 64 East Main St., in the city's business center. Both display and service facilities have been increased in the new location. Raymond P. Despins and George E. Veillette are the partners.

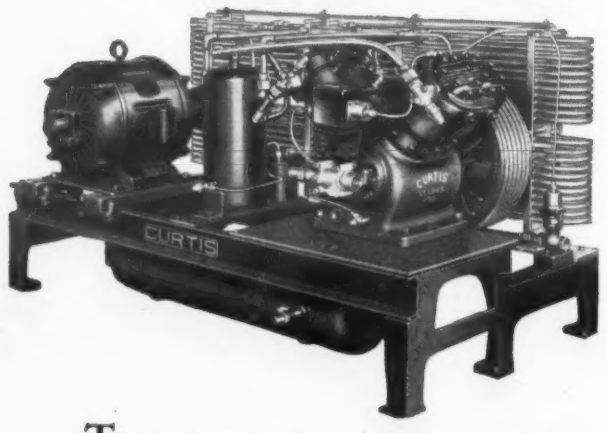
Another Meriden appliance concern, the Dupont Electric Co., conducted by L. R. Dupont, has moved from 65 Meridian St. to 54 Grove St.

10 Carloads of G-E Units Delivered for Campaign

LINCOLN, Neb.—"Prosperity is returning to the great Middle West," reads a sign on the side of 10 carloads of General Electric refrigerators being delivered to the Iowa-Nebraska Power & Light Co., here for the G-E "Refrigerania Sweepstakes Spring Drive," soon to open.

As the train passed through Cleveland, a number of officials of the specialty appliance sales division of the company, which has headquarters there, inspected it in the railroad yards. Among them were H. H. Bosworth, manager of the central station section; A. L. Scaife, advertising and sales promotion manager; Wil Galpin, retail sales manager; Paul Dow, Carle Robbins, Gus Hart, and Bob Dute.

ONLY **CURTIS** CAN GIVE YOU



- The Most Complete Line (*65 sizes*)
- Timken Tapered Roller Bearings (*long life*)
- "V" Type Radial Design (*short sturdy crankshaft*)
- Patented "Centro-Ring" Oiling (*Positive Pressure Type*)
- Water Cooled Cylinders and Cylinder Head (*Highest efficiency*)

These features insure highest efficiency, low operating cost and long life.

There is a correct CURTIS Unit for every Commercial, Industrial or Air-Conditioning installation.

Sizes 1/6 H. P. to 15 Tons

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Company
1912 Kienlen Avenue, Saint Louis, U. S. A.

In Canada
CANADIAN CURTIS REFRIGERATION CO., LTD.
20 George Street Hamilton, Ontario, Canada

McCORD Refrigeration PRODUCTS

COMMERCIAL EVAPORATORS
DOMESTIC EVAPORATORS
CONDENSERS
METLFLEX ICE TRAYS
SPIRAL FINNED TUBING
AIR CONDITIONING SURFACE

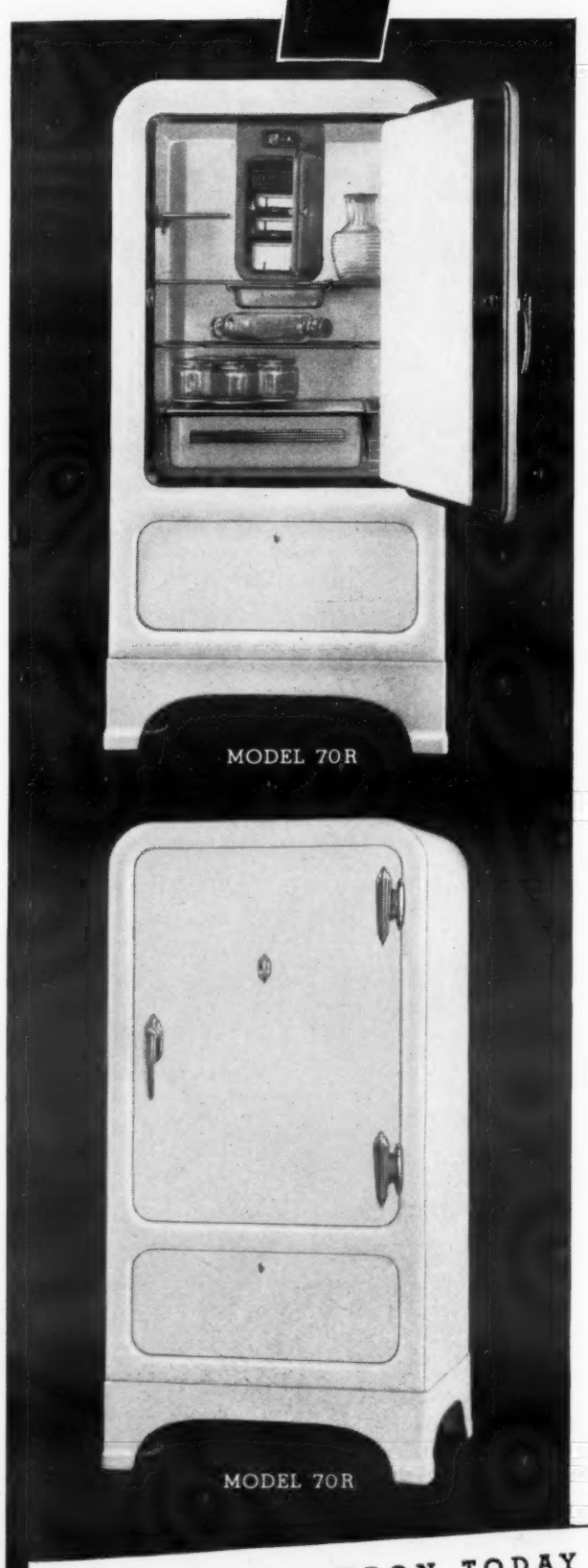
McCORD RADIATOR & MFG. CO. - DETROIT

"I'VE JUST BEGUN TO FIGHT!"
—John Paul Jones

Grunow

WITH SAFE, MAGIC CARRENE

PUTS ALL COMPETITION ON THE DEFENSIVE!



● The beautiful new 1936 Grunow refrigerators with their Seven Smashing Superiorities are placing in an embarrassing position those who said it couldn't be done.

And every one of these thousands of electric refrigerators will place in an embarrassing position any man who attempts to substitute inferior merchandise for the unique advantages that only Grunow can give.

And we mean UNIQUE!

Other refrigerators have been improved—but they haven't caught up with Grunow.

Only with super-safe Carrene is such a spectacular store or home demonstration possible.

Only with the new rubber mounted and spring suspended patented Grunow power unit that has only one major moving part is such quietness and economy possible.

The 1936 Grunows again set the pace in beauty and safety. They have a host of new convenience and economy features that every woman wants.

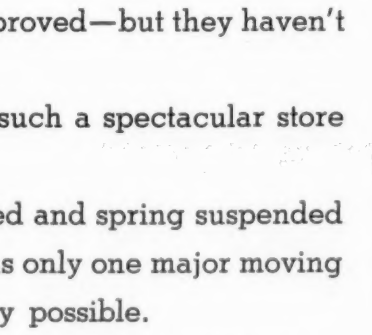
The smart dealer will recognize the big money making possibilities and will prefer to sell the BEST refrigerator instead of attempting to sell against it.

And get this: although low in price, Grunow is the 1936 refrigerator with 25% added value.

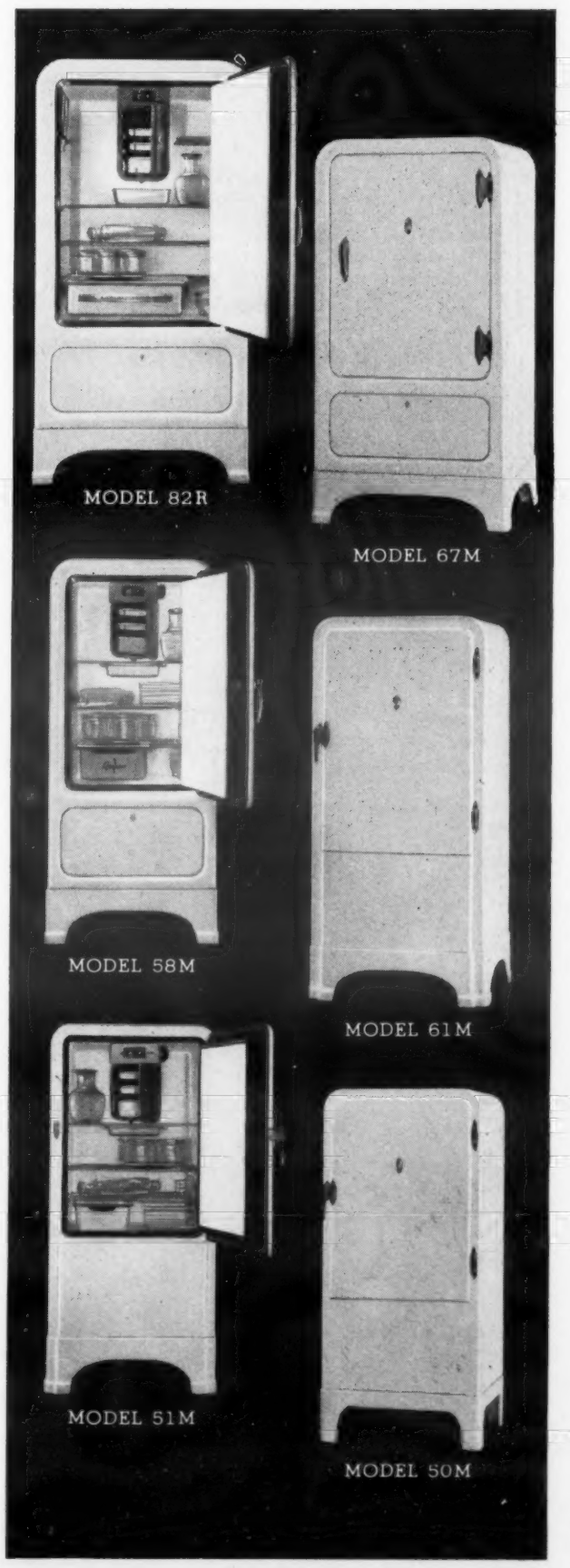
☆

GENERAL HOUSEHOLD UTILITIES COMPANY
CHICAGO, ILL.

Also Makers of the Famous Grunow Radio



The demonstration that sells women



MAIL THIS COUPON TODAY

GENERAL HOUSEHOLD UTILITIES COMPANY
Dept. 101, Chicago, Ill.

I am interested in the big money making possibilities in the Grunow dealer franchise. Please send me full information about

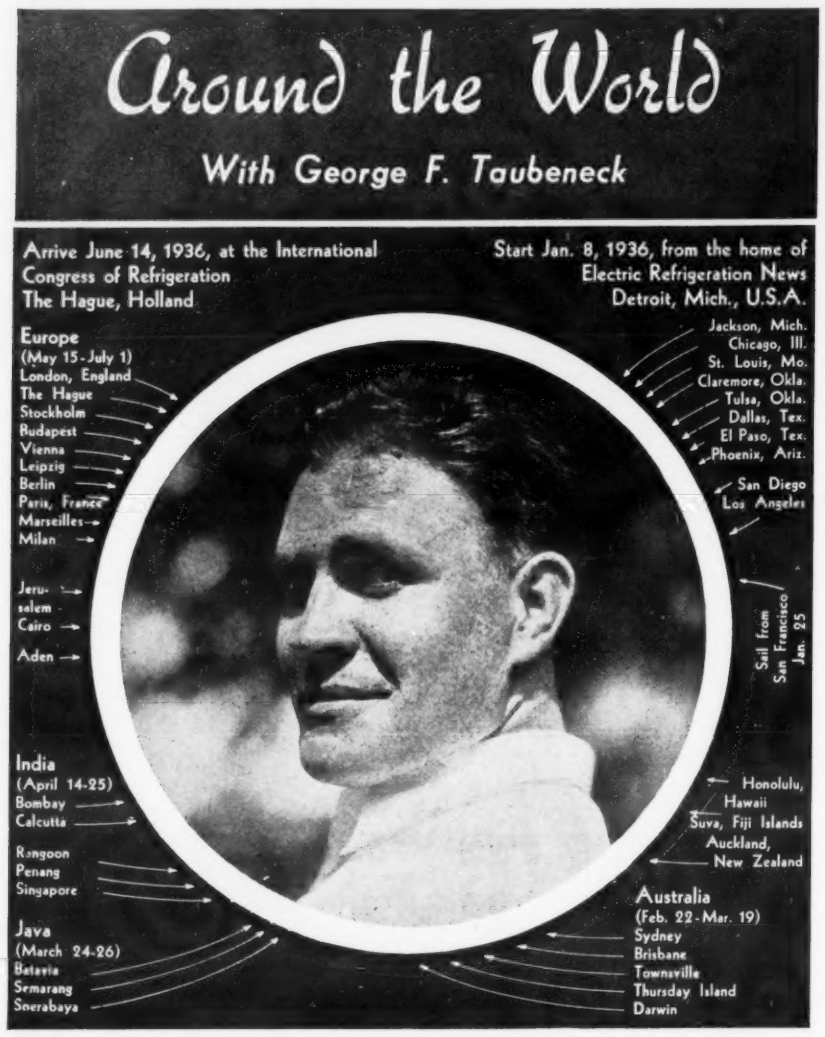
☐ Refrigeration Franchise ☐ Radio Franchise

Name.....

Street Address.....

City..... State.....

GROW with GRUNOW IN 1936



DURING the past week George Taubeneck, editor of ELECTRIC REFRIGERATION NEWS, has crossed the equator on the good ship *Mariposa* and is now "down under" somewhere among the islands of the southern Pacific between the Fijis and New Zealand.

He is due in Auckland on Feb. 21 and will arrive in Sydney, Australia, next Monday, Feb. 24. After a 12-day visit he will start northward again, making several short stops in Australia and Java, arriving in Singapore, March 28.

Other ports of call include Penang, Rangoon, Calcutta, Bombay, Aden, Cairo, and Tel Aviv (Palestine). About the middle of May he will land in Europe and make the rounds of the principal cities.

On June 14 he will attend the International Congress of Refrigeration at The Hague, Holland, and will present a paper on the development of household electric refrigeration in the United States.

Here's Country!

Undoubtedly the high spot of the cross-America jaunt, as far as scenery is concerned, was the 440 miles between El Paso and Phoenix, Ariz.

If you ever take this motor trip (and we hope you do) start early, so you won't miss anything by having to do night driving.

You'll be held up at half a dozen points at least, by state and government officials who'll ask you questions, and make you open up all your baggage so that they can see if you are importing any undesirable insects into their precious country.

Just what damage a chinch bug, boll weevil, or whatever it is that they are supposed to look for (the inspectors simply poke around half-heartedly, and at a safe distance from the extraneous etymological specimens, if any) might do to the mountains, desert, cacti, or Mexicans, we couldn't figure out.

One of these way stations was named, with ludicrous appropriateness, Gripe, Ariz.

Anyway, start early, for you'll be stopped an annoying number of times, and you'll want to stop often, yourself, to drink in the almost holy beauty of the rugged landscapes.

(Note: We later found out that Coolidge, Roosevelt, and other dams have irrigated old valleys into new fertility, and that the states are trying to protect these nascent farms; also that this system is a very effective means of stopping the progress of criminals. So maybe we were too hastily irritated.)

* * *

No Apache Dances

Leaving El Paso you drive against a right-up-close background of sheer stone mountains, of bluish slate shades, with tinges of purple.

Then you go by the shacks of Mexican families, and the hovels of Apaches.

No, honey, these are not the kind of Apaches who do the dance where the guy comes out in a striped sweater and dippy cap, smoking a cigarette, and slams the girl around, taking money from her garter, and then swings her around by her hair.

Those Apaches are named after French hoodlums, who are supposed to act like that (we'll soon be seeing for ourselves).

The Apaches we mean are the last remnants of the once fierce tribe of American Indians which did quite a bit of tomahawking out in these parts some years ago.

Today the great grandchildren of those he-men have become the final prospects for weary used cars.

The Indians exist inside of blobs of mud and sticks which would be igloos if they were made of ice (these hutches are called "hogans," but they are about as Irish as "HANK" GREENBERG.

Outside of *every* "hogan" is an antique pile of junk which is some three years past the pension age.

More of these mud teepees—a regular community of them, so close to the roadside you can stop and watch the squaws wash their papooses (something the missionaries must have taught 'em, for it doesn't come natural)—affront your sense of civilization just before you come to Coolidge Dam.

* * *

Maybe We Won't Sell

Deming, New Mexico, claims to have the purest water in the world. Government tests prove it is 99-99/100 per cent pure, the citizens declare, thereby upping Messrs. Proctor & Gamble by 55/100 of a per cent. Its taste is swell.

We stopped at a combined service station, garage, and restaurant in Deming along route 80, and got the best lunch we've had on the trip (top dinner was served us at The Jug in the Coronado hotel, St. Louis, with marvelous bouillabaisse as the *piece de resistance*). Cheap, too. Name: the De Luxe.

When Bob drove in I was typing, and the service station proprietor's jaw dropped down to his vest buttons.

"Have you been running that typewriter riding over these roads?" he queried, obviously astounded.

"Yes, sir, steadily ever since we left El Paso an hour and 20 minutes ago." His jaw seemed to drop even further.

"Why, that's 104 miles," he ejaculated. "Let's see," he engaged in some lightning—well, rapid, anyway—calculating. "You averaged 78 miles per hour!"

Bob replied that he hadn't been pushing it, and that he really could have driven much faster.

Still in a daze, the proprietor filled up the tank with 23-cent gas. It took nine and one-half gallons, further amazing the garage man, for the average consumption had been better than 10 miles to the gallon.

We told him the car was for sale, and that we were asking $600 for it. After we finished lunch he came up to us and said he'd like to have that car, but didn't have the cash. However, he was the local dealer for Hudson and Studebaker in that town, and would give us a new Studey or a Terraplane for the three-years-old Auburn, even trade.

That sounded like a pretty fair deal, but Bob and I both voted to go ahead to California. We agreed that driving the Auburn the remaining thousand miles would be ever so much more fun—plus being faster and safer—than driving a Terraplane or light Studebaker.

By the bye, a garageman in El Paso told Bob that MAE WEST had put her car up in his place a few nights previous, and that it was just like ours. So we are looking forward to having people yell, "hi, Mae" at us when we get into Hollywood.

Bob insists we shouldn't sell at all. He wants to drive it right back to Detroit after I walk over the gangplank into the *S.S. Malolo*.

* * *

Bewildering Geometry

After Deming comes Lordsburg, where the business of putting up connected tourist cabins has been brought to its zenith. Between each cabin (there are dozens in the series) is a garage with doors which lock.

The cabins themselves are better than most kitchenette apartments. The connected cabin rows are harmonized architecturally (simple Moorish style) with the filling station and lunch rooms, so that the whole seems like a doll city set out in the middle of the desert.

At Lordsburg you must make up your mind whether to travel Route 80 or Route 180 into Phoenix. First you'll see a big billboard advising that if you take Route 80 you'll save 90 miles. A little further there is a bigger billboard (the first liar never has a chance) proclaiming that those who traverse Route 180 will save 100 miles.

We chose the latter because we learned that it ran directly over Coolidge Dam.

It did, too, but first it took us through the most breath-taking, awe-inspiring, eye-smiting (hey, waiter, bring us another glass of adjectives) mountain—or any other kind of—scenery your prairie-reared correspondent has ever beheld.

While Bob careened the speedster around Contortionistic curves with the right rear wheel pawing the air over the brinks of precipices like those that heroes used to push villains over in the movies, I was hanging over the side, trying to photograph-on-the-fly an amazing kaleidoscope of gargantuan angles and totally unimaginable geometric forms—all painted lavishly "with brushes of comet's hair" in colors no chemist would hope to duplicate.

If the pictures turn out to be good and accurate in every detail, I still won't believe we saw such sights.

* * *

Engineers Match Nature

Coolidge Dam is a terrifically big man-made structure filling a gap between two of Nature's majestic convolutions to produce a sight that is truly noble.

By the time you have reached it, you have completely lost touch with reality, having long since climbed Jack's Beanstalk into Giants' Land.

(Continued on Page 6, Column 1)

G. F. T.'s Paris Address

Letters to the editor intended to reach him upon his arrival in Europe should be addressed in care of Mr. H. A. Granary, Frigeco, S. A., 79 Avenue Des Champs Elysees, Paris (8e), France.

Cablegrams will reach the editor in Australia up to March 6 if addressed as follows: "Locklove—Taubeneck—Sydney." The 25-word night letter rate from Detroit to Sydney is $5.25 (plus 10¢ tax). The deferred cable rate is 31½¢ per word, regular rate, 63¢ per word. The address, as given above, counts three words.

The Editor Stops to Do Some Work Among the Scenic Wonders of the Apache Trail

On the beautiful Apache Trail in Arizona-New Mexico. Top Row: (1) Desert vegetation and distant peaks give the editor some swell "color" for his travelogue sketches. (2) Recording an eye-filling scene between Globe and Phoenix, Ariz. (3) The editor and Bob Nixon couldn't resist the chance to rest a moment in this cliff dwelling, 6,000 or more feet up and a mile and a half off the trail, near Roosevelt Dam, Ariz. (4) A few miles east of Globe. (5) On their way. The travelers leave El Paso, heading west. Bottom Row: (1) "Boy, what beauty! My kingdom for some color film!" (2) Editor and Auburn against a backdrop of cactus, sagebrush, and mountains. (3) Back to the level after pictorially plumbing a rocky ravine. (4) On the road directly above Roosevelt Dam. (5) Pausing for a final snapshot before continuing on into California.

General Motors to Exhibit Frigidaires In 45 City Shows

NEW YORK CITY—Special showings of General Motors products, including household products such as refrigerators and air conditioners, as well as motor cars, are being held in exhibition halls of 45 major cities on varying dates, beginning Feb. 1 and concluding May 2.

The shows, most of them a week in length, are being held earlier this year, due to the early introduction of new models in November of last year. To gear in with the general climatic conditions of the various sections of the country, the majority of the later showings will be held in the North, to take advantage of better weather conditions.

Besides the latest models of General Motors cars, electric refrigerators, air conditioning, water coolers, electric fans and ironers, oil burners, light plants and pumps, and other appliances will be shown.

Each showing will have the same decoration background, consisting of sateen wall panels, broken by light columns and Ruscus trees. In the center of the hall, mounted on an oblong platform, surrounded by railing 12x20 ft., will be a replica of an automobile plant with two sets of miniature trains entering and leaving the factory. During the evening the factory will be lit from within and the synchronized flashing of lights behind black silhouette figures will provide the illusion of men at work.

Music will be provided in each city afternoons and evenings, and in many cities amateur contests and style shows will be staged in conjunction with the exhibition.

The showings will be held in the following cities on these dates: Feb. 1-8, Jacksonville; Feb. 8-15, Baltimore, Charleston, Norfolk, Richmond, St. Louis; Feb. 22-27, Birmingham; Feb. 22-29, Columbus, Kansas City, Memphis, Omaha, Peoria, South Bend; Feb. 23-29, Cincinnati; Feb. 25-29, Phœnix; Feb. 26-March 2, Indianapolis; Feb. 29-March 7, Nashville; March 7-11, Youngstown; March 7-14, Akron, Cleveland, Detroit, Providence, Scranton.

March 9-14, Denver, Portland, Seattle, Wichita; March 9-15, Louisville; March 17-21, Dayton; March 21-28, Davenport, Pittsburgh, Salt Lake City, St. Paul; March 22-28, Minneapolis; March 23-28, Buffalo, Des Moines, Spokane; March 28-April 4, Milwaukee, Rochester, Syracuse, Tulsa; March 31-April 4, New Orleans; April 18-25, Los Angeles; April 25-30, San Francisco; April 25-May 2, Oakland.

New Presentation Plan Increases Sales 5 Times

NEW ORLEANS—Executives of the Interstate Electric Co., Crosley distributor here, decided to experiment with the company's method of presenting the new Crosley line to its dealers this year—and the "experiment" resulted in sales that were five times greater than those made last year.

In place of the usual sales meeting with its speeches and banquet, the company held a three-day "open house" display in the convention hall of a prominent local hotel. More than 300 dealers from Mississippi and Louisiana attended the open house.

Models of the 1936 line of Crosley refrigerators, radios, ironers, and washing machines were arranged about the hall. A specially lighted refrigerator display occupied a prominent position on the stage.

Dealers were invited to stop in whenever they could, and view the line. Distributor's salesmen, with instructions to make no attempts at "buttonholing" the dealers, were present to answer questions.

"This experiment has been so successful," declared H. V. Monninger, advertising manager, "that we will probably use this method to introduce all our new products to our dealers."

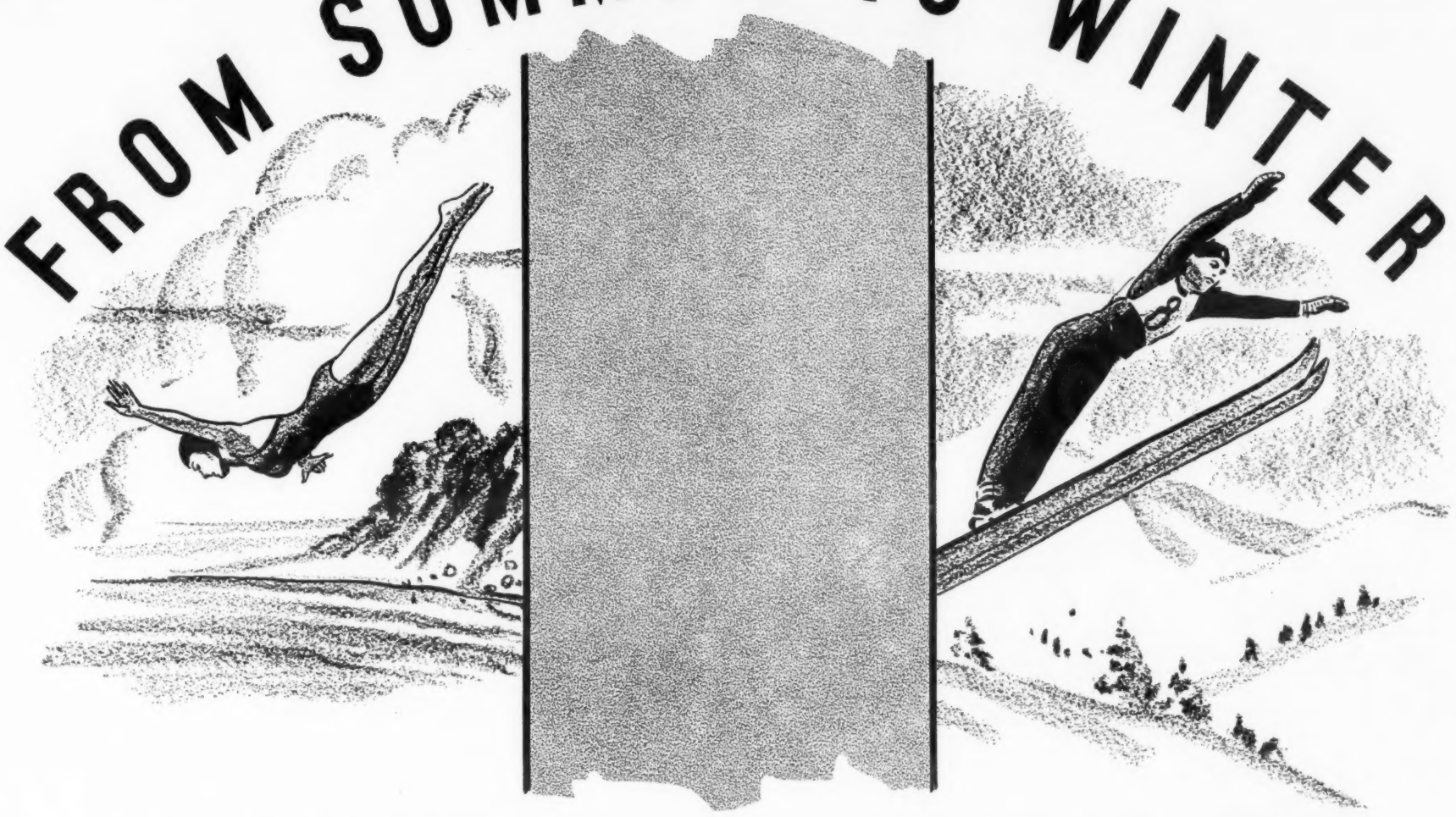
G-E Plans Series of 1-Day Dishwasher Schools

CLEVELAND—Plans for a series of one-day dishwasher schools to be conducted by General Electric home appliance distributors throughout the country were announced by C. J. Enderle of the G-E dishwasher division.

Conducted by the product division's field representatives, these schools will be devoted to demonstration and sales methods used in merchandising electrical dishwashers. Sales personnel of the distributorships, dealers, and power companies will attend.

Opens Refrigerator Dept.

NASHVILLE, Tenn.—H. Brown Co., furniture and electrical appliance store here, is celebrating its thirty-fifth anniversary this month by adding a special department for refrigerators and other electrical appliances.



IS ONLY ⟷ THIS FAR

in a refrigerator

There must be perpetual Winter in your refrigerator if it is to give proper food protection to owners. No matter how warm the kitchen may be, your refrigerator must maintain a dependable chill.

The insulation in this thin wall is the solitary guard against overlapping seasons. If heat gets through this vital wall too fast, you'll find Springtime inside instead of the safe cold of Winter. Even with poor insulation, a good refrigerator can overcome this handicap, but only by overworking the unit. This results in longer operating time, increased current costs and deterioration of the machine.

Many materials will slow down this heat transfer when the cabinet is new. But after a period of use a serious interference is set up because moisture gets into the refrigerator wall.

It has been conclusively proved that water vapor in the form of a gas easily penetrates the steel refrigerator shell and any so-called "moisture seals," and condenses inside the walls, out of sight. This is due to the temperature difference between the room and the food compartment, which may amount to as much as 60 degrees. This moisture soaking into most materials more and more completely destroys their insulating efficiency. Only "non-hygroscopic"—that is, non-absorbent—insulation is unaffected by this phenomenon of physics.

And that is why Dry-Zero in any refrigerator saves from 30c to $2 a month in operating costs. Dry-Zero is non-hygroscopic. It is unaffected by moisture. It enables the unit to keep proper inside temperatures economically. And for the entire life of the refrigerator.

The famous Dry-Zero Laboratory has made many exacting tests on a number of refrigerators. A resume of results will be sent you if you will write for a copy. Just ask for "Results of Moisture Tests." No obligation.

DRY·ZERO
REG. U.S. PAT. OFF.
THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

Dry · Zero Corporation • 222 North Bank Drive CHICAGO, ILLINOIS • 687 Broadview Ave. TORONTO, ONTARIO

Around the World

With George F. Taubeneck

(*Continued from Page 4, Column 5*)

And then comes this half-mile long, 300-feet high engineering triumph—complete with power plant, ski-jump spillways, and arches molded by a colossus—to jar you back to Earth. As EL HERRON would say, "it can't be."

We arrived just at dusk, which added to the illusion that we were somewhere on Mars.

* * *

Encircling Globe

When we arrived at Globe, Ariz., we were exhausted—emotionally as well as physically. So we attempted to eat a so-so meal while the shades of night were falling fast outside.

Although it will take me more than six months to encircle the globe, we went all around Globe in a matter of minutes. When we came back to the car, we had decided to stay, for the natives of this mountain village had convinced us that we "ain't seen nothing yet," and that if we attempted to negotiate the suicidally curvaceous ascents and descents ahead of us by night, X would likely mark the spot.

Having been on a titanic natural roller coaster for three hours, we took no more chances, and turned in for the night at the Dominion hotel.

* * *

A King Goes Begging

Torn right out of every story with a western mining locale we ever read is the lobby of the Dominion. In its heyday it was a pretty dressy place, we bet, but that was years and years ago, when Copper was King.

Today copper doesn't command such good prices, and the Miami, the Inspiration, and the Old Dominion (a Phelps Dodge property)—mines which once poured wealth into Globe—aren't very active. This is, nonetheless, one of the richest copper-producing areas in the world.

Globe was founded in the seventies as a silver mining camp. Asbestos, vanadium, quicksilver, lead, manganese, and even gold are also mined in Gila County, of which Globe is the trading center.

At present archeology seems to be the most lively industry thereabouts. Gila Pueblo, a seat of research into Indian antiquity, is a Globe institution which has unearthed much genuinely interesting information about the mongoloid race which put up four-story apartment buildings in cliff cavities along about the thirteenth century, B.C.

Lots of sheep herders and cattlemen trade there, too; as does the new breed of farmers who are harnessing the resurrected fertility of the Casa Grande (Coolidge Dam) and Salt River (Roosevelt Dam) valleys.

Besides claiming to be America's leading copper mining district, Globe asserts it has "the world's best all-year climate" (it's prescribed for sinus sufferers, "lungers," and people who hate rain or snow), and the nation's best fishing (bass in San Carlos lake—formed by Coolidge Dam, and trout in nearby mountain streams.

But if you come, bring your own cook and your own covered wagon. Even the best of the accommodations are a little sad.

The Apache Trail

From Globe to Phœnix you have your choice of trails. We chose the old Apache Trail, which is a few miles longer and is not hard-surfaced, but which carries you through mountain scenery so giddily gorgeous you'll be satisfied to die after having seen it.

Also this trail takes you past Roosevelt Dam and Tonto National Park, where an ancient Indian cliff dwelling is cared for by a most amiable young man.

Roosevelt Dam is named for Teddy, not FDR. It isn't the biggest of the federal reclamation projects out in that region by a long way, but it was the first, having been put up in 1906. It is 273 feet high, 1,125 feet across the top, and forms a 25-miles long lake. Generates power, too.

The Tonto cliff dwellings are reached after turning off Apache Trail and following a *real* trail, rocky and narrow, up the side of a mountain.

Finally you come to a little clearing, where a United States forest ranger "batches it" in a little brick dwelling, sans radio. He does about six hours guide work a day, keeps the park in good shape, lectures occasionally at a neighboring CCC camp, and studies archeology during the lonely evenings.

It's about an hour's walk up the mountain trail from the clearing to the cliff dwelling, but it's well worth it. There you'll see the remains of a two-story multiple dwelling of some Salado Indians, who put it up to protect themselves from the raids of the fierce Apaches.

Built out of tree branches, cacti, and mud around 300 A. D., this structure has three rooms and a vestibule to each story. It nestles in a hole high up in an almost sheer cliff, and should have afforded the ingenious, if unwarlike, Salados a maximum of possible protection against the Apache raids.

For seven centuries this dwelling withstood the ravages of time and the Apaches. But in seven years tourists—seeking souvenirs—demolished a good part of it. (One result of this vandalism is that you see a cross-section of the construction. The United States government is now restoring it little by little.

On the downward path from the cliff dwelling you pass the world's second tallest cactus—47 feet high. The tallest, three feet higher, is further up the Apache Trail.

These spined green plants growing for years and years, are sturdy and straight, and, like the skunks, are their own best protection.

* * *

George's Gorgeous Gorges

Arizona is said to have the highest motor accident rate of any state in the nation; and you can well understand why after you have piloted a car around the corkscrew sweeps of a graveled road like the Apache Trail.

It's just wide enough for two cars to meet and pass; and then sometimes both must back up and try again in order to negotiate the riffle without pushing the outside one over the rim and out of the world.

With the fastest stock car in the world, and two heavy-footed young drivers, it took us 11 hours to go 93 miles (counting our stop at Tonto National Park, and any number of pauses to admire the view).

When you go around these sharp curves, which is most of the time, it's necessary to honk your horn, and keep well on your side of the trail to prevent a smack-up, for you can't see more than a few yards ahead *on the trail* because of the sharpness of the turns.

You wind and wind and wind, double and redouble, climb and drop, twist and slide until you're dizzy and your arms ache.

But, boy! Is it worth it! Each vista grabs your breath and holds it a little longer than the preceding one. We must have shot 200 pictures en route; but the sad part of that is our failure to record the colors, which are positively unduplicated in all our experience.

The lofty spreading plateau of the Roosevelt watershed is cut into rugged canyons, gorgeous gorges, rainbow-hued crags and palisades, whirlpooled rocks of fantastic shapes, lakes (where "lungers" and other recuperants live) of silken texture and mirroring blue sheen, and Norwegian-like fjords.

Caverns, canyons, cliffs, crags, castles, colors, cacti—and all under a canopy of the bluest heaven this side of Italy—the Apache Trail came close to being the high spot (no pun) of the cross-country trip.

* * *

Ain't Seen Nothin'

When we arrived all out of breath at Phœnix and tried to arouse some enthusiasm among the citizens there about what we'd seen, all we got was a general pooh-pooh and a:

"Hell, podner, you ain't seen nothin' yet."

It seems that the scenery is just beginning where we left off. Up in northern Arizona you really get it.

The Grand Canyon, Boulder Dam (which makes those we saw look like Erector set toys), Fortification Mountain, Navajo Bridge (467 feet above the river, 616 foot span), Dinosaur canyon (immense rocks bearing dinosaur tracks), Oak Creek and Walnut canyons, Meteor mountain, Montezuma's Well (never-yet plumbed crater lake), Southwestern Arboretum, Colossal Cave, San Francisco Peaks, the Painted Desert, Hopi Indian villages, Mission of San Xavier del Bac, Pipe Springs National Monument, Navajo and Wupatki National Monuments (where prehistoric Indian ruins and cliff dwellings are preserved by the government), Sunset Crater, the Petrified Forest (prehistoric trees, 250 feet long, petrified and rainbowed by Nature), Montezuma Castle, Chiricahua National Monument (a wonderland of wind-eroded rocks), and the Casa Grande Ruins (four-storied prehistoric community dwelling, with canal system, and remarkable murals—one could spend a summer delightfully and instructively in Arizona without seeing everything.

* * *

Philosophy from Zup

First person we saw in Phœnix, Arizona, was BOB ZUPPKE, University of Illinois football coach. "Zup" once told us in the presence of a grinning multitude of behemoths that we should give up football and take up truck driving, or maybe it was house painting.

But later, on a lengthy trip through the southern states with the Illinois baseball team, "Zup" advised us to see as many places and get as many experiences as we could before reaching the age of 30. So it was with no little satisfaction that we told him about our trip around the world.

"Are you doing it for a purpose?" he shot out in that shrill treble voice of his, which can be heard up in row 327, tier 18, top deck of the Stadium, during practice.

Yes, we said, the trip was for the purpose of . . .

"Don't tell me about it," he cried, "I just wanted to be sure you'd dig your fingers into some soil!"

* * *

Air-Conditioning Capital

Phœnix, Arizona, refrigeration distributors are quick to assert that Phœnix is the air-conditioning capital of the world. They insist that more air-conditioning equipment has been installed there, proportionately, than in any other city on the globe. About that claim, we shall see (let you know in six months).

Most of the theaters, hotels, and office buildings of this desert city are air-conditioned, as are many of the private residences. The summer's heat requires it, they say.

Carrier seems to have made most of the installations thus far. For example: the big, new Westward Ho! hotel, the Arizona hotel, the Title and Trust Bldg., the Telephone Exchange Bldg., the Heard Bldg., and the Fox Theater. Unaffiliated contractors have done a big business in Phœnix, too.

Tidmarsh Engineering Co. of Phœnix and Tucson is Arizona distributor for both Carrier and Norge products. The Phœnix branch is housed in one of the most beautiful distributorship headquarters we've ever seen—and that includes a lot of territory, my friends.

ARNOLD "JACK" GREGORY, wholesale man for this concern, told us that last year they sold 28 carloads of Norge refrigerators in their territory.

Replacement business is excellent.

"Phœnix is where they bury the punks," he told us. "Not only do summer days register terrific temperatures, but the nights run from 90° to 95° F. No jillopie can stand up under that strain for very long, and it gets the best of them in a few years."

REX GRAYNER of the sales department took us back to a large room where refrigerators taken in on trade in the last couple of weeks were standing. These included Majestic, General Electric, Grunow, Copeland, and Gibson models of varying ages.

Mr. Grayner also uttered a hooray for Mr. Roosevelt before he quit telling us about the tough time of it a refrigerator has in a spot where the minimum temperature for July and August days is about 97° F. He thinks the New Deal has been a real boon to the refrigeration business.

* * *

Income and Climate

Proprietors of the Electrical Equipment Co. of Arizona are SAM KAHAN, president, and M. C. JENNINGS, secretary-treasurer. Kelvinator, Philco, and ABC products are their lines. They also operate out of Tucson.

Their store in Phœnix is quite handsome, and completely air-conditioned, too. Prospects for air-conditioning equipment (they sell Kelvinator room coolers) are brought right into the display room to *feel* the comfort.

Mr. Kahan and Mr. Jennings had just arrived the day before we walked in, having returned from the Kelvinator convention in Detroit by automobile. They thought it quite a kick to see us there, recalling having watched us stumble around the platform at the convention.

Last year they sold 18 carloads of Kelvinators, and made 12 installations of room coolers, including a 10-ton job.

Because of the hot climate and the high relative incomes of the citizens, Messrs. Kahan and Jennings declare that Phœnix is an ideal market for refrigeration and air-conditioning equipment.

"In 1936 if we don't break all records with Kelvinator we might as well give up," smiled Mr. Jennings.

Boxes of 6 and 7 cu. ft. capacity sell best in that territory. The units must have ample capacity, or they will flounder under the excessive load.

When we walked in they were reading ELECTRIC REFRIGERATION NEWS, and examining a globe.

"Nice trip," Mr. Kahan observed.

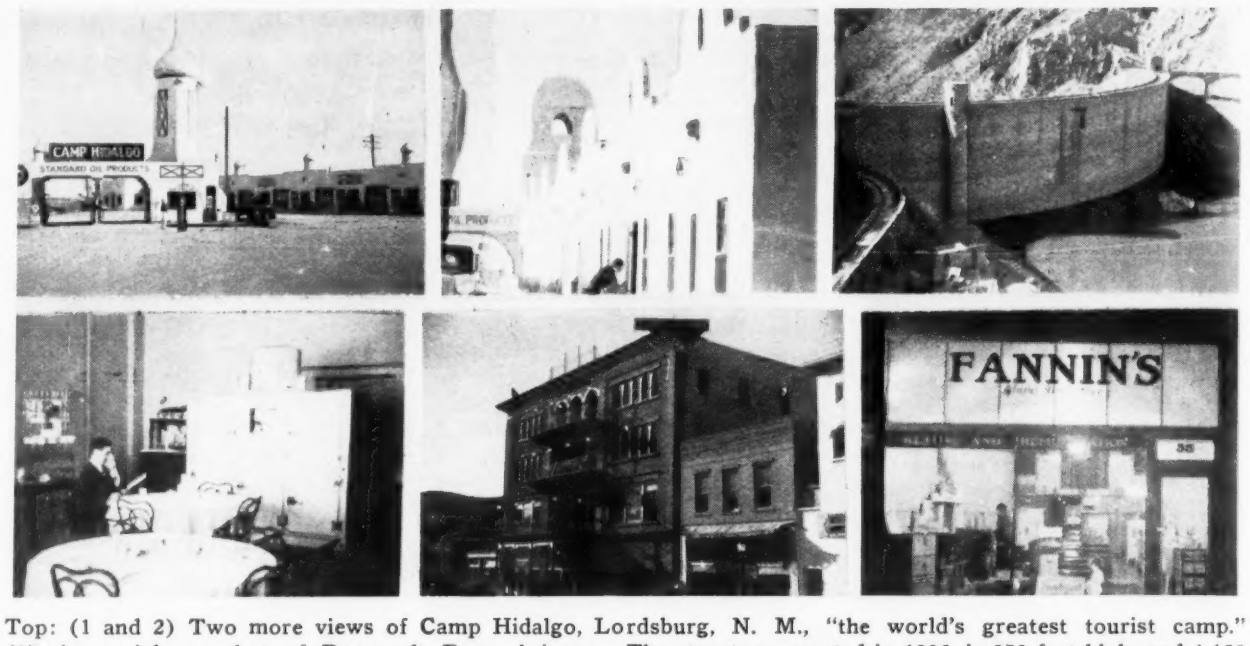
* * *

Likes Guarantee

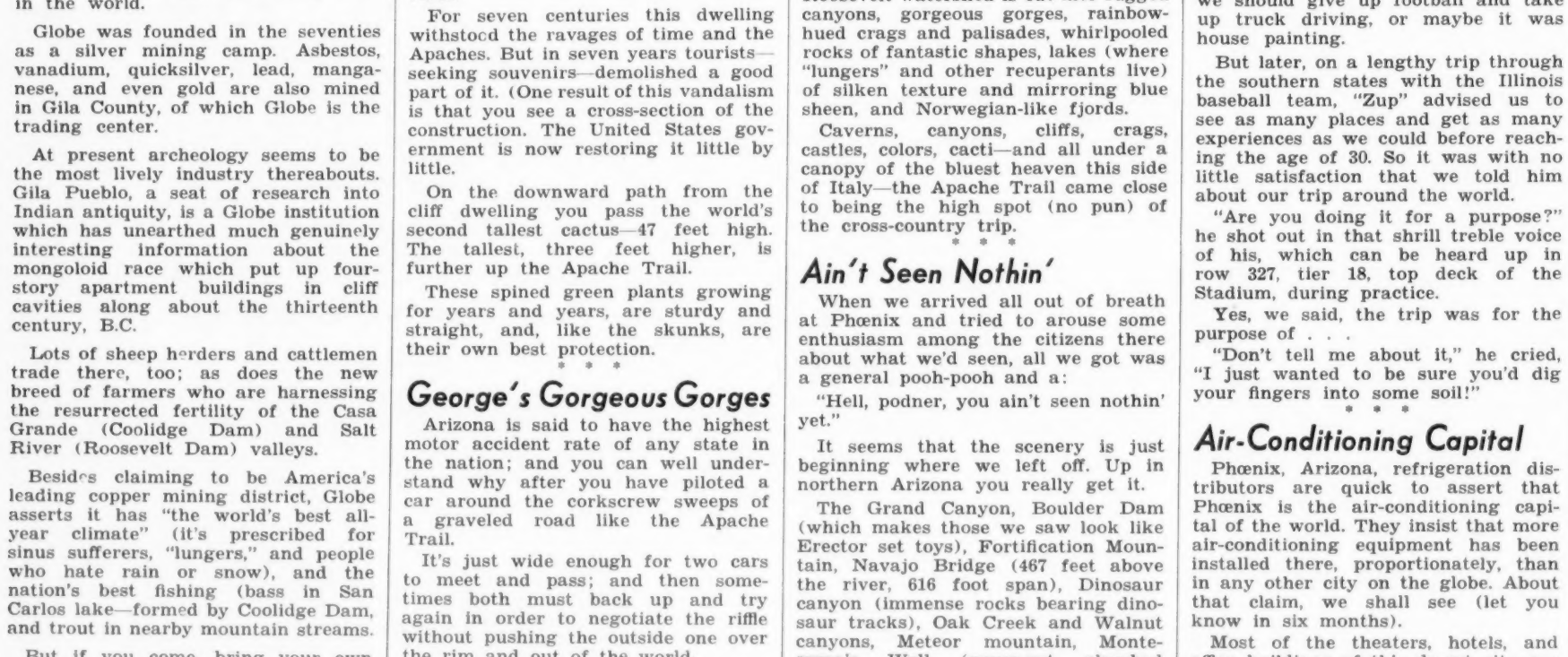
At the Vinson Carter Electric Co., Westinghouse dealer, we found Salesman F. M. GRAY, who last year sold 84 refrigerators. His dealership is served by the Westinghouse Electric Supply Corp., of which TOMMY

(*Concluded on Page 7, Column 1*)

Along the Trail from El Paso to Phoenix



Top: (1 and 2) Two more views of Camp Hidalgo, Lordsburg, N. M., "the world's greatest tourist camp." (3) An aerial snapshot of Roosevelt Dam, Arizona. The structure, erected in 1906, is 273 feet high, and 1,125 feet across. Bottom: (1) Bob Nixon waits for breakfast in the dining room of Hotel Dominion, Globe, Ariz., right near the prominently displayed General Electric refrigerator. (2) Exterior of Hotel Dominion—a palace of splendor when copper was king. (3) Fannin's heating and refrigeration store, Leonard dealership in Phoenix.



(1) A quick check-up on gas and oil at a filling station in Deming, Ariz. (2) At the most famous auto tourist camp in the world, Hidalgo Courts, near Lordsburg, N. M. (3) Covering a big territory well. George A. Banks, owner of Banks' Paint Store, Globe, Ariz., and his five salesmen sold 80 of the 300 units placed during 1935 in a 50 by 150 mile territory. The store is a Kelvinator-Electrolux dealer. (4) Scrambling back to safer ground after snatching a snapshot from a lookout point along the Apache Trail.

Around the World

With George F. Taubeneck

(*Concluded from Page 6, Column 5*)

THOMAS IS APPLIANCE SALES DIRECTOR. Mr. Thomas was out when we called.

Mr. Gray finds his chief selling weapon is the five-year service plan, and says the dealership has experienced no trouble whatsoever in carrying out the terms of the contract with its customers.

Frigidaire is sold in Phœnix by the O. W. Watkins Co. and, like nearly all Frigidaire outlets, they do a whale of a business.

The Dorris-Heman department store, which sells most of the leading makes (franchises vary—sometimes a make is in, sometimes out) is probably the biggest dealer. Fannin's store does a nice Leonard business. R. J. BECK handles G-E.

Nelson Radio & Sporting Goods Co. had the only window display of Atwater Kent refrigerators this writer has ever seen. (He understands that Atwater Kent will not be in the refrigeration business in 1936.)

Electrolux refrigerators are also sold by this firm, which operates a radio broadcasting station as a promotion stunt (good one, too).

* * *

Phoenix, Arizona

Rising sheerly and brightly out of a desert which is likely still astonished, Phœnix is a spic-and-span toyland city. Into a brilliant blue sky aspire tall white skyscrapers, huge church edifices, sturdy hotels, and clean residences.

Capital of Arizona, Phœnix is also a southwestern distributing point and a winter health resort. Since 1914 it has been praiseworthily administered under a city manager form of government.

Cheap electricity and natural gas, an abundance of low-cost fruit and vegetables, and comparatively low taxes make Phœnix an economical place to live, thus raising real wages of workers to a point where appliance buying becomes relatively easy.

Many residents are wealthily retired people; and many more rich people winter there, because of the equable climate and temperature—which were the most pleasant of any city we visited on the trip.

Residents of Phœnix say they live in the Valley of the Sun. Low wind velocity and low humidity are provided by the protection of low mountain ranges nearby, the absence of neighboring bodies of water, and the height (1,080 feet above sea level).

It is the largest city between El Paso and the Pacific Coast, and as such takes care of a thriving commerce.

Feeding into Phœnix are truck garden vegetables, cantaloupes *en masse*, vast quantities of head lettuce from two annual crops, thousands of carloads of edible dates, and citrus fruits (two-thirds grapefruit) from 20,000 acres of trees.

All this produce has been made possible by desert reclamation. Farmers are all members of the Salt River Valley Water Users Association (a misnomer, for the water is all fresh). More than 240,000 acres have been made fertile by irrigation with water stored up by the government's series of mighty dams out in that region.

These dams make reservoirs for the storage of winter rains and spring snow-thaws. They also develop hydro-electric power, which is sold to mines and municipalities, thus reducing the cost of water to the association members.

This series of dams is a gravity irrigation project. Farmers not included in the system irrigate their farms with water electrically pumped from deep wells.

Soil is alluvial, and rich.

Ethnologists declare that the cliff-dwelling Salados, and other Indian tribes of that early period, had irrigation systems of their own, as well as towns, cities, and temples.

Phœnix is also the distributing point for the great cattle and sheep ranches of Arizona, and for the products of the dairy and poultry farms. Because of the climate and the rarity of storms, these latter don't need roosting houses for their chickens.

Populated by smart-looking women, and healthy, exuberant girls, Phœnix is a sight for travelers' eyes. Phœnix men are either conformant to the type of Southwesterner described in our Texas story, or are sick.

* * *

Litchfield Park

Mr. Zuppke was staying at an interesting resort hotel, the Wigwam, in Litchfield Park, which is just off Route 180. This hotel and village was developed several years ago by the Goodyear Tire and Rubber Co., which came to Arizona in 1916 to plant Pima cotton for use in the manufacture of tire fabric.

The town of Litchfield is a model village, with well-paved streets lined by palm trees, flowers, and shrubs, and excellent shops and schools.

In the midst of a 25-acre desert oasis stands the Wigwam, a highly informal hotel where the sports jacket has superseded the dinner jacket, and where flowers have replaced gold bric-a-brac.

Conjunctive with the Wigwam are 15 guest houses, or "Wickiups."

* * *

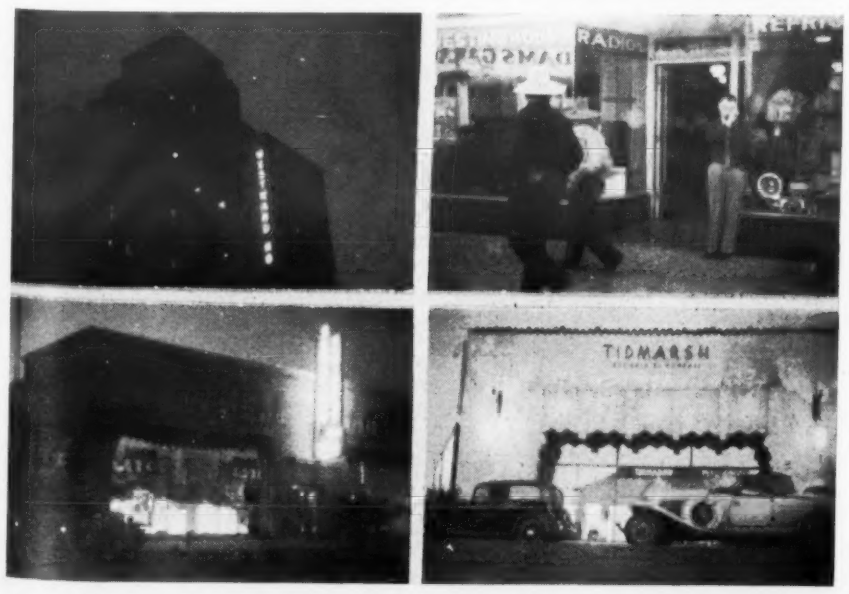
Yuma, Arizona

All our driving between Phœnix and San Diego was done at night, so we didn't see much of the country. Did stop at romantic Yuma, though, to see the court house where so many famous people take out marriage licenses.

For one reason after another, Yuma has been bobbing up in the news almost since its founding by two Jesuit priests in 1538—even though its "metropolitan" population is only 8,000-odd.

We were told there that Yuma is the "Sunshine Capital of the United States" (with annual precipitation of three and one-half inches); that it has the largest icing plants in the country—for use in storing cantaloupes, lettuce, and winter vegetables, and that it is also an important center for dates, figs, pecans, and alfalfa.

Day and Night Views from Phoenix



Top left: Phoenix, Ariz., claims the air-conditioning championship of the world. The new Westward Ho! hotel is an example of one of its large installations. Right: A couple of cowhands peer in at the display of Vinson Carter Electric Co., Westinghouse dealer. Salesman F. M. Gray is in the doorway. Bottom left: The air-conditioned headquarters of Electrical Equipment Co., Kelvinator dealer in Phoenix and Tucson. Right: Tidmarsh Engineering Co., Carrier-Norge distributor, does a bang-up business in both refrigeration and air conditioning from this headquarters office, which Editor George Taubeneck says is one of the most beautiful he has ever seen.

THE HOT COMMERCIAL LINE
• IS WESTINGHOUSE •

● Westinghouse "Commercial" Refrigeration has scooped the industry! With new, important, exclusive advantages, Westinghouse has given commercial dealers a new lease on life.

Quicker, easier, selling with a dramatized Simplified Selling Plan. Relief from hours of estimating, with the SIMPLOGRAPH. And real profit insurance with hermetically-sealed units and 5-Year Protection Plan. No wonder Westinghouse is the HOT commercial line for 1936.

SELL 5 OUT OF 6

More good news! Westinghouse hermetically-sealed units meet 83% of the market. You can sell their exclusive features to 5 out of 6 buyers, for the line includes those sizes which accounted for 83% of the industry's sales in 1935.

And for the 6th buyer, of larger installations, Westinghouse offers the new HIGH POWER LINE, built for years of sound, satisfactory performance.

RIDE WITH A WINNER

Get the complete story on these startling new commercial developments that build more sales, more profits. See your distributor, or write to Westinghouse Electric and Manufacturing Co., Mansfield, Ohio.

Note: Direct factory franchises are available in a few of the larger cities. Wire for details.

Westinghouse
Safety Zone
REFRIGERATION

ELECTRIC
REFRIGERATION NEWS

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It's a Bargain in Any Language

MANY subscribers have told us of their great interest in the columns regularly devoted to "Letters." Surprise is sometimes expressed at the wide variety in the *kind of people* who read the NEWS. We too are often amazed and sometimes dumbfounded, by the prodigious volume of the incoming mail.

Most welcome, of course, are the letters bringing information which may be translated immediately into copy for the columns of the paper. Running a close second, are letters giving advance notice of coming events. We are deeply appreciative also of the helpful letters from well-informed readers who call attention to technical errors or supply additional data.

Of unusual interest to us during recent weeks have been the letters of welcome to the editor, received from numerous cities on the route of George Taubeneck's glamorous trip "around the world."

Many of these letters from foreign lands have been published in recent issues of the NEWS, and readers must surely be impressed with the sincere cordiality shown in each and every one. Reading between the lines, we gather that this warmth is not *entirely* due to a desire to be hospitable to a personable young man who happens to be making a trip around the world.

Also, we have reason to believe that our good friends across the sea are not actuated by eagerness to meet the editor in order to *tell him* something. Our appreciation of the friendly spirit which pervades all of these letters is nowise lessened by the thought that the chief reason for all this interest is that the hosts want to *get information from* the visitor.

A brief note from George Taubeneck written hurriedly soon after his arrival at the first port of call emphasizes the truth of the foregoing deductions. The report indicates that the editor is going to encounter some problems in carrying out his announced program of giving U. S. readers the important facts about foreign markets.

Although still in U. S. territory, the visit to Honolulu has already given the editor a taste of what he may expect as he travels farther from the principal center of refrigeration and air-conditioning developments. Referring to the luncheon given by refrigeration distributors of Honolulu and attended by about 80 members of their organizations, he says:

"After talking for about 20 minutes at this luncheon, *they fired questions at me* for an hour and 5 minutes. When I returned to the hotel, there were 13 telephone messages requesting callbacks. These people are *so hungry for information,* that they are difficult to interview. They want to ask all the questions themselves."

When so expert a question-asker as George Taubeneck finds himself outclassed, there must be good reasons for such inquisitiveness.

For some time we have had a growing feeling that export markets offer possibilities for a greatly increased volume of business for the manufacturers of refrigeration and air-conditioning equipment and supplies. If those markets are to be developed properly, it seems clear that more and better information must be provided for the benefit of those who must adapt American-made goods to foreign market requirements.

We will frankly admit that we have not concerned ourselves particularly, in editing the NEWS, as to whether the information given was most understandable or helpful to the foreign reader. Neither have we taken any pains to withhold any information which might be used competitively against American manufacturers. Not knowing what they might want, or what they should not have, we have simply filled their subscription orders and let them interpret the NEWS as best they could.

Refrigeration men who have made the circuit in the interest of export business have often returned to tell us of startling experiences in foreign lands resulting from the world-wide circulation of the NEWS.

For example, we recall the experience of an export manager, several years ago, who made an extensive tour for the sole purpose of unloading his company's surplus stock of obsolete models. Everywhere he went, prospective customers welcomed him with open arms but, to his great disgust, *insisted upon buying the new and greatly improved model reported in the* NEWS.

We were somewhat taken back recently when a foreign visitor explained the reason for his great interest in the pictures which we publish so freely (to the great satisfaction of our supplier of engravings). Said the visitor: "Every picture is closely examined under a magnifying glass and we make a model exactly like it *if we can.*"

As a result of the editor's trip around the world, we hope to get a clearer idea of the informational needs of our foreign readers so that we may, if possible, improve the value of our service to this important section of our circulation. At the same time, we hope that Mr. Taubeneck will be able to "sell" his hosts on one idea, namely, that the best way to *get* information is to *give* it.

Most business men in this country have learned that principle in fairly recent years. There was a time when they wanted information but were loathe to divulge any about their own methods.

One has only to consider the question in mathematical terms to realize the soundness of the present-day theory. It simply means that no matter how much information any one man may have under his hat, or any one company may have within its walls, it is obvious that the sum total of the knowledge of *all other men* and *all other companies* is greatly in excess of that controlled by any one individual or concern.

In other words, when one trades his own knowledge for that of the entire industry, he invariably *gets* more than he *gives* and that is a bargain in any language.

Letters

No Complimentary List

Library Association of Portland
Portland, Oregon
Jan. 29, 1936.

Editor:

Would it be possible for you to put this library on your complimentary list to receive ELECTRIC REFRIGERATION NEWS? Ours is a downtown library and the Periodical Room has an average daily attendance of six to seven hundred persons, so that we can assure you that your publication will be well read and your courtesy greatly appreciated.

HELEN MCRAITH,
Head of Order Department.

Answer: We have no complimentary list. The NEWS is published for people *in the industry* and is not intended for the general public. If the City Fathers of Portland want their citizens to be informed regarding the inside workings of the refrigeration industry they will have to pay $3.00 for the privilege.

Proud Dallas Citizen

A. A. Ways
Manufacturers' Representative
5306 Vanderbilt Ave., Dallas
Feb. 15, 1936.

Dear Mr. Taubeneck:

Want to thank you for the wonderful write up describing conditions you found here in Dallas. As a citizen of Dallas I am proud of our progress and glad that some one capable of passing opinion on to the world at large has done this so ably as was done in your recent article in the REFRIGERATION NEWS.

In closing would ask that 10 copies of this issue of REFRIGERATION NEWS be sent to my home address so that I may broadcast refrigeration as well as Dallas. Will be glad to remit for these or they may be sent expenses collect. A. A. WAYS.

Representative of
Perfection Refrigeration Co.,
Harvey, Ill.

Young Exhibit Overlooked

Young Radiator Co.
Racine, Wis.
Feb. 8, 1936.

Editor:

I note your very interesting issue of Feb. 5 reporting on the Air Conditioning and Heating & Ventilating Exposition in Chicago, where this company exhibited their various products, including an air-conditioning unit, referred to in the circular herewith.

I note the alphabetical reference to the exhibitors and this stops with York and does not refer to Young.

Perhaps there is good reason why the reporters did not mention our equipment, but it was my opinion, from the tremendous crowds that visited our display, it was worthy of reference, and I am just taking the liberty of referring to same as there are a number of firms referred to, who, I am sure, were on at least a par with our company, but not exceeding the interest in the developments which were shown.

I take the liberty of calling this to your attention. If you care to make mention of our equipment and have a photograph of the display of this unit, we shall be pleased to send it.

I take a great deal of interest in reading and noting each issue of your good paper, which is sent to our Research Department, Sales Department, and Engineering Department, and you are to be complimented on the excellent setup which you have and the actual reporting which you usually show, where this is an exception. F. M. YOUNG,
President.

Answer: We're sorry, Mr. Young, that we apparently overlooked you in our visit to the show—or it is possible that you may have been out to dinner when we stopped in at your booth—we can't remember just what did happen at all the 250 exhibits we tried to view.

On page 13 of this issue you'll discover a story on the new Young air conditioner.

Wants to Return Courtesy

Gordon Bros. Pty. Ltd.
Refrigerating Engineers
Complete Line of Equipment—Cold Storage
—Ice Making—Electric Refrigeration
Union St., Brunswick, N. 10
Melbourne, Australia
14th January, 1936.

Mr. Taubeneck:

We were pleased to receive your letter telling of your proposed visit to Australia and trust you will be able to include a visit to us in your itinerary. It was the writer's privilege to visit you in Detroit last May and opportunity of returning the courtesy extended then will be appreciated.

The principal activities in the refrigeration field in Australia are conducted in four capital cities, namely, Sydney, Melbourne, Brisbane, and Adelaide. Assuming you would be traveling on a Matson line boat it would be possible to cover Sydney, Melbourne, and Adelaide, and return with the same boat, this would give you eight days in Australia. Each of the cities mentioned is an overnight train journey apart.

The Matson boats visit Sydney and Melbourne only.

From first hand hurried observations it was the writer's impression that Californian cities are about on a par with the principal places in this country in the development of refrigeration. E. R. GORDON.

Will Show the Works

Westinghouse Sales & Rosebery Ltd.
Successors to
Rosebery Engine Works, Ltd.
Works: Dunning Ave., Waterloo, N. S. W.
Office & Sales: 13 Market St., Sydney, N.S.W.
Cables, Rewl—Sydney
Sydney, N. S. W., Australia
10th January, 1936.

Mr. Taubeneck:

We have to acknowledge receipt of your letter of the 25th November, and are pleased to learn that you are contemplating a trip around the world and anticipate being in Sydney during the first half of 1936.

We will be very pleased to see you during your visit and, also, to show you the Works of this Company at Waterloo.

We would suggest that you communicate with our City Office, 13 Market Street, Sydney, during your stay in Sydney.

K. P. FORMAN, Sales Manager.

Anti-N.D. Propaganda

Francis A. Schaef
6469 Ross St., Philadelphia
Feb. 10, 1936.

Editor:

The firm with which I am connected is a subscriber to your REFRIGERATION NEWS, and I make it a point to read it thoroughly and religiously each week. However, it strikes me that you are going in heavily for Anti-New Deal propaganda, and it would please me occasionally to see a defense of New Deal policies appearing in your paper from disinterested parties. Of course, I realize there is no responsibility on your part to present any comments that may not be in line with your own personal attitude.

However, as we get a little deeper into the question, it would seem to me that we reach the fundamental issue of whether the REFRIGERATION NEWS is a paper presenting the news of the week as it reaches you, or is it an organ devoted more or less to the propagation of your own view point, or that of course, of your publisher.

I cannot but feel that your entire subscribership list is not 100 per cent Anti-Roosevelt Administration, consequently I am prompted to ask that you permit those who may feel differently than you do, some space occasionally, to present rebuttal views.

F. A. SCHAEF.

Comment

By F. M. Cockrell

Reactions from Readers

The material published in the columns of ELECTRIC REFRIGERATION NEWS, both editorial and advertising, excites frequent comments from subscribers ranging in tone all the way from apologetic inquiries to violent criticisms.

These reactions are received in the form of letters, telegrams, telephone calls, and personal conversations with various members of the staff.

Our most active critics use the long-distance telephone, usually, it appears, within a few minutes after receipt of the current issue. More often than otherwise, they do not want to be quoted, thus much informative, and sometimes exciting, copy is denied our readers.

* * *

Just a Fight Fan?

The letter immediately above, from Francis A. Schaef, reminds me of a remark made by one of our nice little stenographers just before a heavyweight championship fight. "I don't care who wins," she exclaimed, "but *I do hope one of 'em knocks the other'n cold.*"

Apparently Mr. Schaef has no particular arguments to offer himself, but he would like to see somebody put up a good fight for the New Deal.

As for rebuttal of our criticism of New Deal policies, it has been conspicuous by absence. In fact, the *only* such letter received during the past few months was published *in full* in the Jan. 18 issue. It occupied a full column and another full column was used for my comment on the letter.

Under these conditions, it does not appear that advocates of the New Deal have been suppressed by this publication.

Look at the Record

If Mr. Schaef has read the NEWS "thoroughly and religiously each week" during the past *three years,* he must have noted that all of the plans and programs devised by the New Deal for the regulation or stimulation of business have been reported promptly and in great detail in the columns of this paper.

If he will turn back through the files he will find that we took the initiative in calling an all-industry meeting of refrigeration executives in Detroit for the express purpose of discussing the NRA plan.

He will find a "Blue Eagle issue" of ELECTRIC REFRIGERATION NEWS (Sept. 6, 1933), printed in two colors, and containing "The first roster of refrigeration manufacturers who have signed the President's Re-employment Agreement—as a record of the industry's activity to date in cooperation with the Government's program for industrial recovery." (The list occupies two pages.)

Association and committee meetings were reported and many columns were given for the publication of codes, revisions of codes, and *revisions of the revisions.*

Code hearings were reported verbatim. Rules and regulations were published, as were revised rules and regulations, *ad infinitum, ad nauseum.*

* * *

Whoops for the NRA

We must admit, with apologies, that we whooped it up for the NRA, not by editorial endorsement, but rather by the voluminous publicity given to the program and all of its ramifications as affecting this industry.

Like many another U. S. citizen, I had become so worn by the grind of the depression, that I looked with favor upon any plan which seemed to offer reasonable hope as a solution for our economic troubles.

Like many others, I saw so much suffering and despondency, that I began to question some of the rules of sound business accumulated in some 35 years of "making a living."

Perhaps the new generation of university-trained economists had really found out what was the matter with the economic system and knew what to do about it.

It is true that the NEWS turned sour on the whole NRA program, as did business men generally throughout the country, for one good sufficient reason, namely: *because the damn thing wouldn't work.*

* * *

The Pump Has Been Primed

Now that the brain trusters have had free rein for a full three years and the rest of us have had an opportunity to see just what they were trying to do, and now that we have seen how futile and absurd so many of their theories have proved to be, I am frankly skeptical of any and all schemes for *manipulating* this country into prosperity.

This paper has freely given President Roosevelt full credit for breaking the *psychological* depression. He certainly stimulated the American public to new *hope* for better things.

It was grand to see somebody spending money again, even though the government was doing most of the spending. But we are waking up to the realization that we have been on a drunken spree, and our tax bills begin to indicate that we must pay a terrific price for the party. It doesn't look so good.

The "pump has been primed" in a magnificent manner and we are in favor of putting all hands on the pump handle again.

That's the way we feel about it, mister, and we don't care who knows it. If any of our good subscribers feel differently, they are welcome to express their opinions.

* * *

Worth the Price?

We'll add one more thought, and that is about the *debt.* Looking at it in terms of all past experience, it appears to be almost unbearable. But if the accumulation of that debt has taught this country a lesson in economics, it may be worth the price.

If there is anything in the theory that *we learn from experience,* then the lessons we have learned from the New Deal ought to keep this country from going hay-wire again for another hundred years.

Within a 10-year span we have swung from one extreme to the other. Ten years ago the country became obsessed with the idea that everybody should get *rich.* Now the sentiment is that everybody should be *poor.*

Ten years ago the man who worked long and hard at his job was scorned as a dumbbell who didn't have sense enough to *play the stock market.*

Now the popular idea is that any man who has managed to hold on to his home and keep his business going should be raided and cast into jail as an enemy of society.

Having seen the country go stock-market crazy and New-Deal crazy, I am in favor of concentrating our efforts on hard work, straight thinking, and rigorously honest methods.

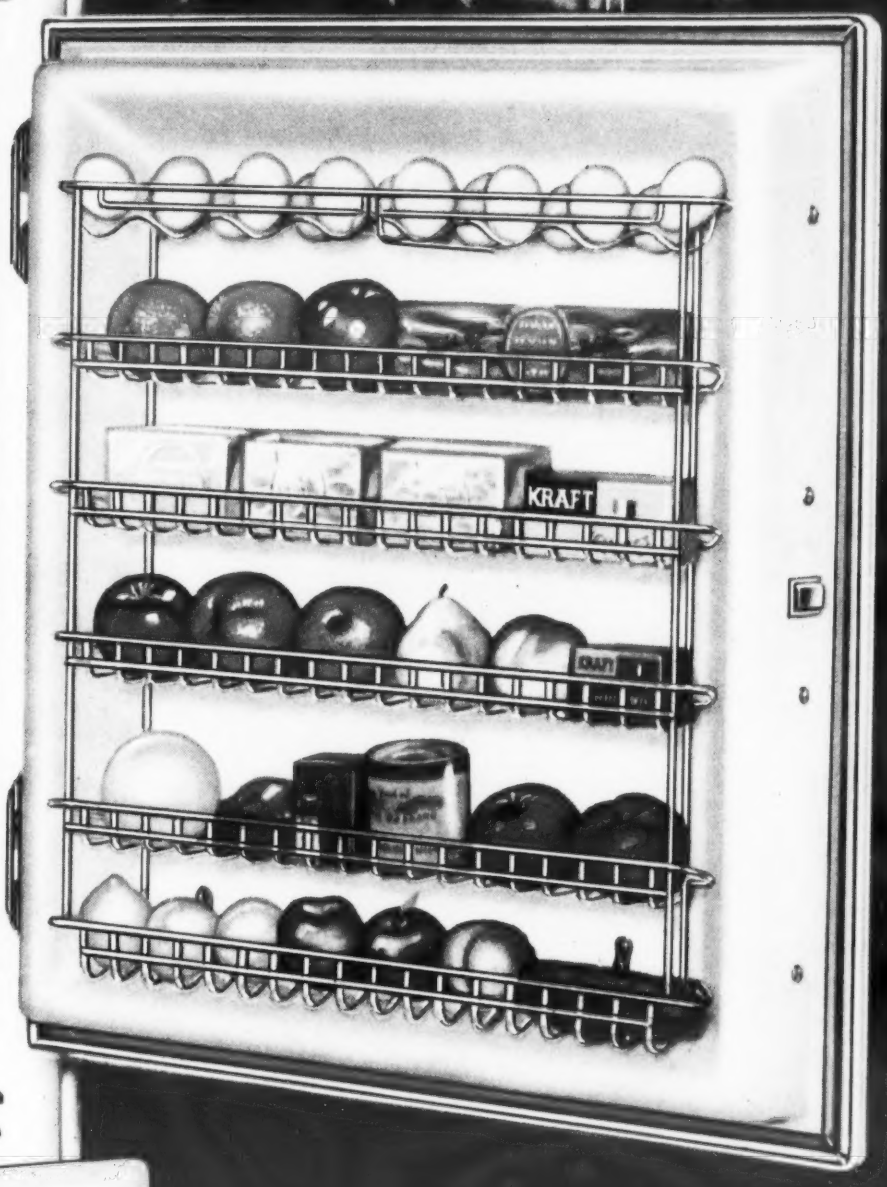
CROSLEY

PRESENTS

THE WORLD'S MOST BEAUTIFUL REFRIGERATOR

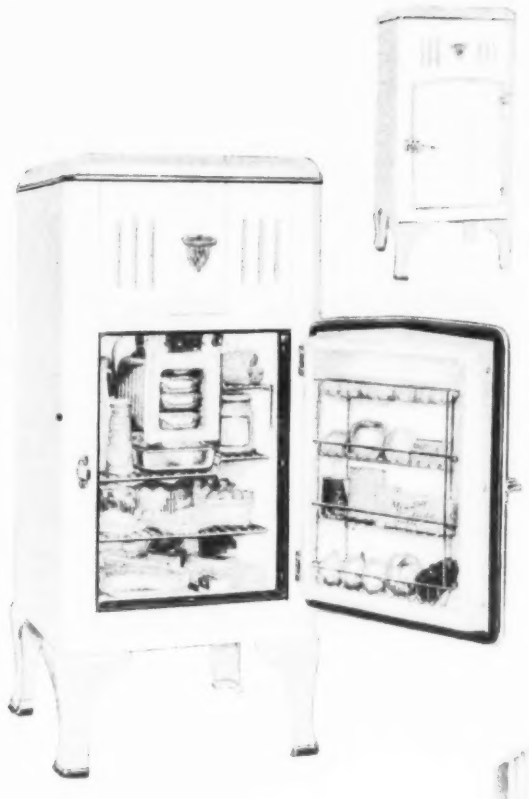
the World's Most Beautiful Refrigerator *

tor • and this much more in



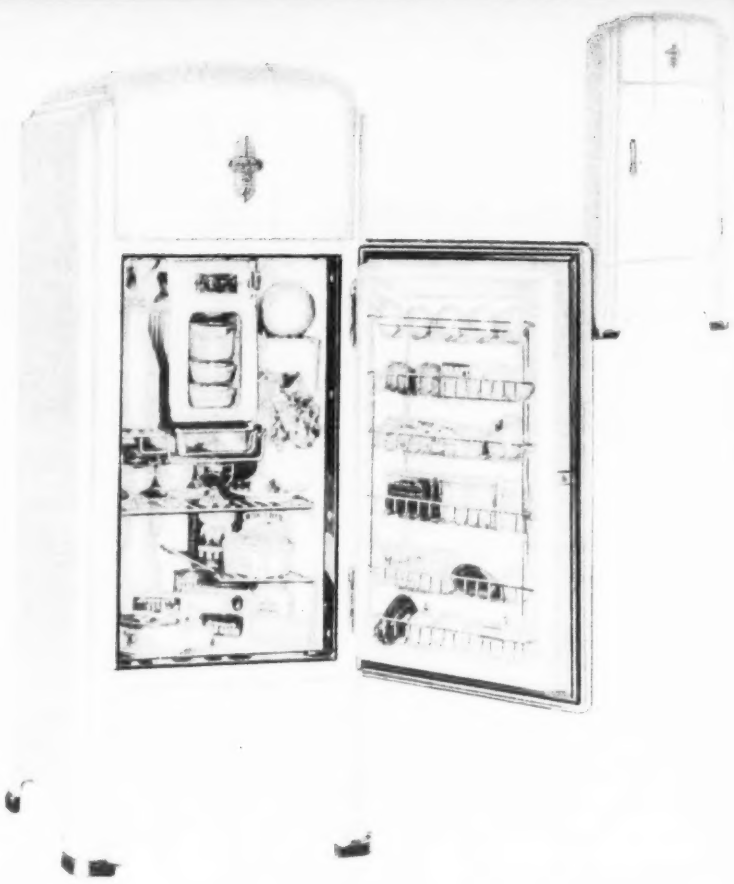
CROSLEY TABLE SHELVADOR GAQ-30

This compact table model Shelvador is extraordinarily roomy. Crosley quality through and through. Has 3 cu. ft. NET capacity; 6.92 sq. ft. shelf area. The two ice trays have a total capacity of 42 ice cubes. Features include: The incomparable Shelvador that adds usable capacity without adding to size. Porcelain top. New temperature control. Porcelain interior. Dulux exterior. Chromium plated hardware. Dimensions: 36" high, 23⅝" wide, 25" deep **$94.50**



CROSLEY SHELVADOR GAQ-35

Big enough for the average family, this compact, but unusually roomy, Shelvador. No other refrigerator of similar rated size can compare with it in usable space. A beauty in every line. NET capacity 3.5 cu. ft. Shelf area 7.44 sq. ft. Three ice trays each holding 21 cubes — 63 ice cubes in all. Round-corner one-piece porcelain interior. Dulux exterior. Fast-freezing. Double-belt compressor. Dimensions: 50⅜" high, 23½" wide, 25½" deep **$99.50**



Crosley Shelvador GAQ-43 (Standard)

New-type streamline beauty. NET capacity 4.33 cu. ft. Shelf area 9.07 sq. ft. Two ice trays and one double-depth tray—84 ice cubes in all. New-type double-belt compressor. Dimensions: 56⅜" high, 23⅞" wide, 24⅝" deep..... **$119.95**

Shelvador GAT-43 (Standard)

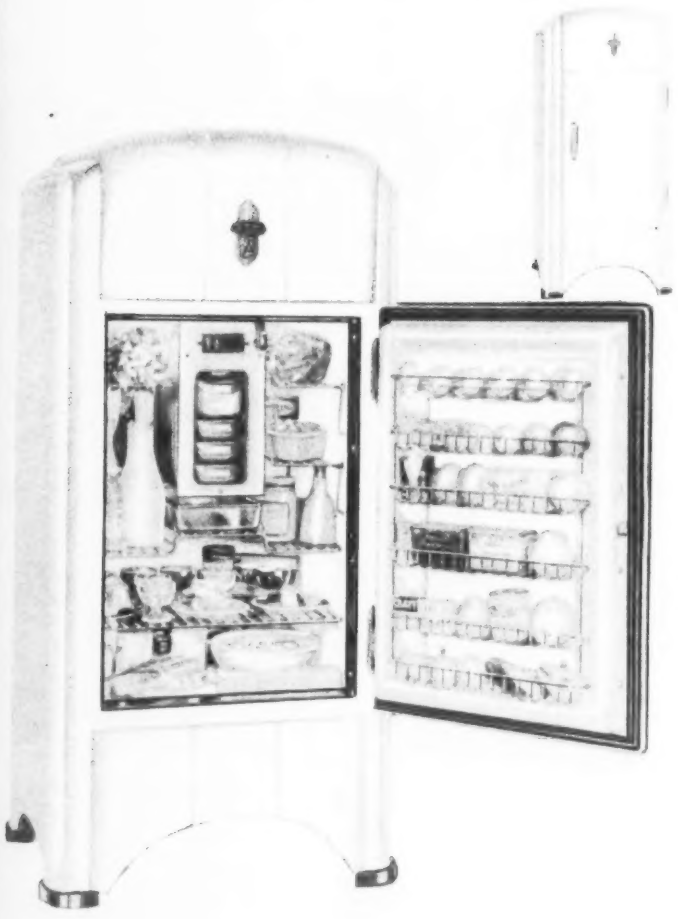
Same as above except has the new Hermetic compressor **$134.95**

Shelvador GKQ-43 (DeLuxe)

Same as GAQ-43 except has DeLuxe Cabinet, including Storadrawer and Crisper..... **$129.95**

Shelvador GKT-43 (DeLuxe)

Same as above except has the new Hermetic compressor **$144.95**



Crosley Shelvador GAQ-50 (Standard)

Smartness to enrich the finest kitchen: quality to insure many years of trouble-free service. This model has the new double-belt compressor. NET cu. ft. capacity, 5.07; shelf area, 12.34 sq. ft. Three ice trays and one double-depth tray—105 cubes in all. Round-corner porcelain interior. Dulux exterior. Satin finish chrome plated stamped brass hardware. Feather-touch "Knee-Action" door handle. Dimensions: 56 7/16" high, 27½" wide, 24⅜" deep **$137.95**

Shelvador GAT-50 (Standard)

Same as above except has the new Hermetic compressor **$154.95**

Shelvador GKQ-50 (DeLuxe)

Same as GAQ-50 except has DeLuxe Cabinet including Storadrawer and Crisper **$154.95**

Shelvador GKT-50 (DeLuxe)

Same as above except has the new Hermetic compressor **$174.95**

Crosley Shelvador GAQ-60 (Standard)

Almost unbelievably roomy is this handsome model—due, of course, to Shelvador. Improved double-belt compressor. Faster freezing. Net capacity, 6.01 cu. ft. Shelf area, 14.37 sq. ft. Six ice trays and one double-depth tray—168 cubes in all. Easy-cleaning porcelain interior; Dulux exterior. Satin finish chrome-plated stamped brass hardware. Feather-touch "Knee-Action" door handle. Dimensions: 58 5/16" high, 29⅞" wide, 26 5/16" deep..... **$149.95**

Shelvador GAT-60 (Standard)

Same as above except has the new Hermetic compressor **$169.95**

Shelvador GKQ-60 (DeLuxe)

Same as GAQ-60 except has DeLuxe Cabinet including Storadrawer and Crisper **$169.95**

Shelvador GKT-60 (DeLuxe)

Same as above except has the new Hermetic compressor **$189.95**

Crosley Shelvador GAQ-70 (Standard)

A remarkably beautiful model of outstanding popularity and value. Plenty of room—everything at your finger-tips, thanks to the Shelvador feature. NET capacity, 7 cu. ft. Shelf area, 15.68 sq. ft. Six ice trays and one double-depth tray—168 cubes in all. Among the features: Feather-touch "Knee-Action" door handle; the double-belt compressor; porcelain interior; Dulux exterior; newly designed hardware. Dimensions: 58⅞" high, 33¼" wide, 26⅞" deep **$169.95**

Shelvador GAT-70 (Standard)

Same as above except has the new Hermetic compressor **$189.95**

Shelvador GKQ-70 (DeLuxe)

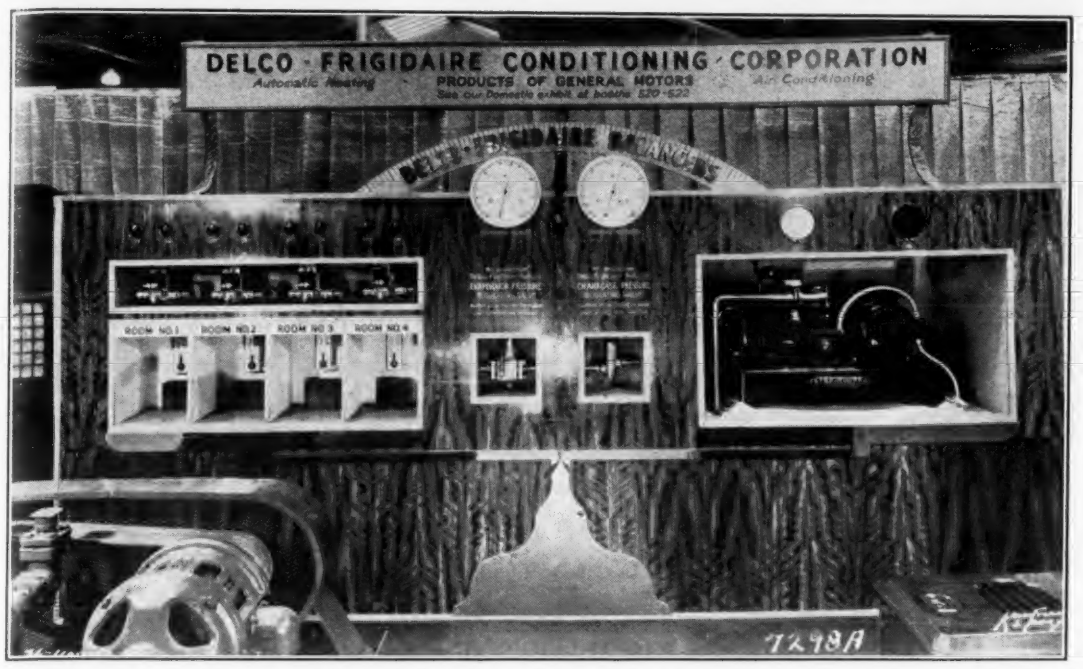
Same as GAQ-70 except has DeLuxe Cabinet including Storadrawer and Crisper **$189.95**

Shelvador GKT-70 (DeLuxe)

Same as above except has the new Hermetic compressor **$209.95**

All Prices Slightly Higher In Florida, Texas, Rocky Mountain States and West • All Prices Include Delivery, Installation, One Year Free Service

Manufacturers Show Latest Refinements in Equipment at Chicago Air-Conditioning Show



Delco-Frigidaire Conditioning Corp. had two booths at the Fourth International Heating and Ventilating Exposition, and the one shown here featured an operating model of the Frigidaire "balanced" valve arrangement for a condensing unit which serves a number of air conditioners.

Burge Ice Machine Co., Chicago distributor, introduced in its booth 1936 Baker condensing units, and the "Krack-Engineered" products of Refrigeration Appliances, Inc. Baker roller bearing compressors were exhibited and Krack's new room coolers were shown in operation.

Air Conditioning

Year 'Round System Developed by Young

RACINE, Wis.—A new air-conditioning unit, designed for year-'round use with vapor, steam, or hot water heating plants or in a split system, has recently been introduced by Young Radiator Co. The unit was displayed at the Fourth International Heating & Ventilating Exposition last month in Chicago.

The unit consists of a compact cabinet, containing a heating coil, a cooling coil, air filter, moisture eliminator, blower, and humidifying chamber. Used with vapor, steam, or hot water systems, the unit becomes the sole source of heat; in a split system, it operates in conjunction with other heating equipment.

In operation, air drawn by the fan through the recirculating duct passes into air filters and is relieved of dust particles and other impurities. Then it passes through the heating coils, where its temperature is regulated; then through a vapor mist, where humidity is determined. Excess moisture is removed by the cooling coils, and the air is then passed by fans through ducts into the rooms.

Cooling coils in the unit are designed for either well or ice water circulation; tap water may also be used, if its temperature is low enough.

In case mechanical refrigeration is desired, the unit may be equipped with an evaporator, which replaces the regular water coils. In climates where little cooling is needed, the blower may be used to clean and circulate the air without the use of a refrigerant.

Dual thermostats are used in both heating and cooling, each thermostat having two separate circuits, which, in heating, are set 1° apart and, in cooling, 3° apart. In heating, the first thermostat starts the fan, giving a supply of tempered air at all times except in mild weather. When additional heat is required, the second thermostat starts the heating equipment.

A simple switch, either automatically or manually operated, swings the system from winter to summer operation. In cooling, the first thermostat starts the fan for air circulation, and the second controls the cooling medium, turning it off or on so as to maintain the desired temperature.

Air Conditioning Increases Beauty Shop's Business

CHICAGO—Air conditioning has brought an increase of 40 per cent in the mid-summer business done by Clyde's Beauty Shop on Lawrence Ave. here, reports Clyde H. Kelly, manager.

Installed last spring by Westerlin & Campbell Co., York distributor here, the equipment includes a 5-hp. Freon machine and two York conditioners.

July business increased from $1,000 to $1,400 per month after the system was installed, and August increased from $900 to $1,400.

Beauty parlor patients appreciate air conditioning because of the many operations involving an application of heat. Further, Mr. Kelly says, both his operators and himself have increased their efficiency approximately 35 per cent since the installation.

41,126 Mechanical Stokers Sold During 1935

WASHINGTON, D. C.—A total of 41,126 mechanical stokers were sold for use in residential buildings during 1935, according to a Census Bureau report based on the sales of 108 manufacturers.

Number of residential sales covering stokers with capacity of less than 100 lbs. of coal an hour was almost double that of the 23,214 sales made in 1934.

Sales of larger type stokers for use in apartment house and commercial buildings also showed an increase over those installed in the previous year.

57 Air Conditioners Installed in Newark During First 9 Months of 1935

NEWARK—What sort of a year air conditioning had here can be seen readily enough by the city's report of 57 installations for the first nine months of 1935, compared with a total of 27 in all years before 1935.

Encouraging in the city's total is the fact that this year, for the first time, installations of conditioning equipment were made in private residences. Seventeen such jobs were reported for the first three-quarters of the year, for a total of 43½ hp.

Gains, or an approximation of totals for all previous years, are recorded in almost every field in the city. Only ones to fall behind were theaters and funeral parlors, the first showing two installations compared with four in all previous years, and the other reporting one installation against two previously made.

Two banks were conditioned, for a total of 172 hp.; 12 offices, for a total of 91 hp.; five restaurants, for a total of 99 hp.; and eight stores, for a total of about 170 hp. A funeral parlor, a doctor's office, and seven installations classed as miscellaneous are also on this year's list.

Type of Establishment	Prior to 1935 No.	Prior to 1935 Hp.	First 9 Mo., 1935 No.	First 9 Mo., 1935 Hp.	Total No.	Total Hp.
Theaters	4	990	2	100	6	1,090
Hotels	1	11	..	..	1	11
Banks	1	137½	2	172	3	309½
Offices	8	170¼	12	91¼	20	261½
Restaurants	1	113¾	5	99¼	6	213
Stores	3	171¼	8	169¾	11	341
Tap Rooms and Bars	1	14	2	11¼	3	25¼
Funeral Parlors	2	17	1	6¾	3	23¾
Doctors' Offices	1	3¼	1	2½	2	5¾
Drug Packing Room	1	2	..	..	1	2
Residences	..	..	17	43½	17	43½
Miscellaneous	..	..	7	49	7	49
Totals	23	1,630	57	745¼	80	2,375¼

York Conditioning Keeps Market Displays Fresh

BALTIMORE—Better product display, less waste, and greater employee sales efficiency are three results of the introduction of air conditioning in Schreiber's Paca and Lexington Sts., and Eutaw St. markets, says Morris Schreiber, president of Schreiber Bros., Inc., operator of a chain of stores in this city.

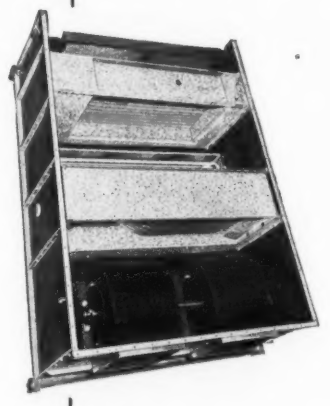
In the two stores in which York air-conditioning systems were installed by the Maryland Refrigeration Co. in 1934 and 1935, Mr. Schreiber says he is now able to keep window displays of fresh meats and delicatessen goods absolutely fresh, where before displays had to be changed at least twice daily.

"An approximate increase of 30 per cent in the efficiency of our clerks helps to account for the increase in business," according to Mr. Schreiber, who finds the Saturday evening disposition of his employees much better.

Heating Contractors Will Convene May 25-27

NEW YORK CITY—The Heating, Piping and Air Conditioning Contractors National Association will hold its forty-seventh annual convention in Philadelphia, Pa., May 25, 26, 27, J. Lawrence DeNeille, president of the association, announced here recently. M. J. Chagnard heads the committee on arrangements.

A New Data Bulletin on Comfort Air Conditioning—



As one of the oldest and largest manufacturers of air conditioning equipment in the world, Buffalo takes pleasure in offering you a new data bulletin on the subject of "Comfort Conditioning with Type PC Cabinets".

We know that the tables, charts and other data contained in this book will be of great value to the engineer, contractor and user of air conditioning equipment.

REMEMBER

We are manufacturers; we do NO installing; we do NOT compete directly or indirectly with contractors!

The "PC" Cabinet shown above is today the most popular unit made. It is making hundreds of friends for us, and for the contractors who install it. It is simple, practical, efficient, easy-to-install. It is well-built. Every sale of a "PC" Cabinet makes a friend!

WRITE for YOUR COPY!

This bulletin is now at the printers. It will be known as No. 501. Write for your copy, TODAY.

BUFFALO FORGE COMPANY
487 Broadway Buffalo, N. Y.
In Canada:
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

Type "PC" Comfort Conditioners

Service Methods

Data on Construction, Operation and Application of Alco Thermo Valves

ST. LOUIS—Alco Valve Co. early this year introduced its new line of thermo valves for refrigeration and air-conditioning applications, after two years of field research and test.

These valves, say Alco officials, have been designed to operate with modern evaporators which have been designed for high efficiency and definite capacities at certain temperature differences, and for operation at a fixed superheat.

Features claimed for these valves are their simplicity in construction and small size. They are also distinguished by the fact that they have line connections in various sizes of either flare or solder, interchangeable by merely changing one flange. It is thus possible to install the valve body as a line fitting, attaching the power assembly later.

The following is pertinent data dealing with the construction, operation, application, installation, and regulation of these new thermo valves:

Construction

Alco series "T" thermo valves consist of only three major parts; the power assembly, the cage assembly, and the body. Forged brass, cold rolled brass, drop forgings, and stainless steel are used throughout, and are machined to precision limits. The entire valve is assembled by two cap screws.

Power assembly consists of the remote bulb and capillary tubing, assembled with the diaphragm housing containing the diaphragm, and welded to the valve cage cover by the atomic hydrogen process, thereby forming a single hermetically sealed unit. Hydrostatic tests reveal the fact that pressures of from 800 to 1,000 lbs. are necessary to rupture the diaphragm.

There are two types of remote bulbs. The external remote bulb clamps to the outside surface of any size evaporator or suction pipe. The insert type is for installations where direct contact with the refrigerant is desirable.

The valve cage assembly consists of all the working parts assembled into a single unit. The construction is such that friction is said to be reduced to a minimum and there is no possible misalignment of parts in action.

The valve body is a single forging which in itself is essentially a flange, since it has a two-bolt male flange facing, joining the body to the power assembly. There are no working parts within the body.

All Alco thermo valves have equalizing ports, either internal or external; and the function of either type of port is to transmit the true suction pressure of evaporator to equalizing chamber below valve diaphragm.

Equalizer

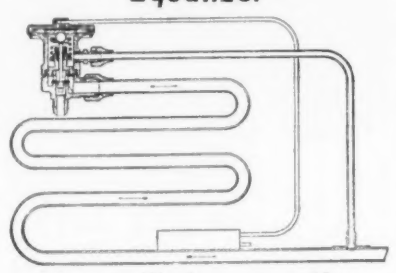


Fig. 1—Hookup on Alco external equalizing tube.

By true suction pressure is meant a pressure not more than four pounds in excess of the suction pressure existing at the point of remote bulb application.

The internal equalizing port directly connects the outlet chamber in the valve body to the equalizing chamber below the valve diaphragm. The external equalizing port is a ⅛-in. pipe tap in the outside of the equalizing chamber, to which is to be attached a piece of tubing connecting that chamber to an opening in the evaporator, suction line, or suction manifold a few inches beyond the location of the remote bulb.

Liquid and suction manifolds containing proper openings for the accommodation of multiple valves and remote bulbs can be had for many standard multi-section evaporators.

Operation

Alco thermo valves are actuated only by the superheat in the refrigerant at the remote bulb location. Superheat is additional heat absorbed by refrigerant when temperature becomes warmer than temperature corresponding to evaporating pressure.

The remote bulb of the valve is placed in contact with, or inserted inside, the suction line at a point near the outlet of the evaporator.

At the start of the refrigeration cycle the evaporator is comparatively warm and the suction gas is superheated. Since the pressure in the remote bulb is proportional to its temperature and since its pressure is, therefore, greater than the evaporating pressure, and since the bulb pressure is transmitted to the chamber above the valve diaphragm by means of the capillary tubing, the valve is opened according to the refrigeration requirement.

Below the diaphragm, the suction pressure of the system as transmitted through the equalizing port, together with the pressure of the closing spring, opposes the bulb pressure.

As the evaporator cools, the pressure above the valve diaphragm decreases due to the cooling of the remote bulb. The thermo valve, therefore, closes in proportion to the reduced pressure above the diaphragm.

It is claimed that Alco series "T" thermo valves will control from no load to full load with less than 4° variation in superheat.

Application

Alco series "T" thermo valves are applicable to any type or style of low side evaporator. They can be used singly, or in parallel, or manifolded as required.

Where there is an intermediate distribution system or any restriction causing a pressure drop of more than 4 lbs. between the valve outlet and the remote bulb location, a false suction pressure will exist at the valve outlet, thus interfering with the proper operation of the valve.

While it is seldom necessary to use magnetic stop valves with Alco thermo valves, certain extreme conditions may exist where their use is advisable.

Manifold Valves

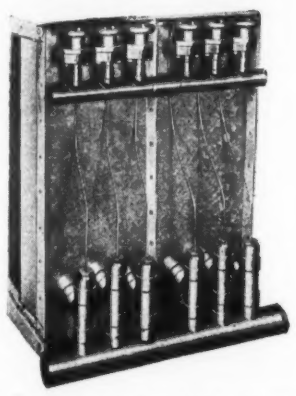


Fig. 2—Thermo valves in manifold with insert remote bulbs.

If the temperature difference between two or more refrigerated units in a multiple system is more than 20° F. a magnetic suction stop valve should be installed in the suction line from the warm unit to prevent possible condensation of refrigerant in the cold unit during shut down periods.

Furthermore, in the absence of a magnetic suction stop valve, the continued operation of the compressor for the proper cooling of the colder units may pump out the evaporator coils of the warmer units, causing those units to become too cold even though the liquid feed to those units be entirely shut off.

Installation

A thermo valve should be used to control the flow of liquid refrigerant to each refrigerated unit in a multiple system, or to each bank of coils in an evaporator.

If a certain evaporator has too many lineal feet, too many abrupt turns, or too small pipe size, that evaporator must of necessity be split to permit proper flow.

Each valve should be installed at or near the evaporator inlet. Each thermo valve and its evaporator must both be of proper capacity and arranged for the requirement. Each thermo valve must be made for the refrigerant being used in the system.

The proper location of liquid and suction connections to and from the evaporator is contingent upon the design of the evaporator and the velocity of the gas as well as the requirements of the job, and should be arranged accordingly.

Valves may be mounted in any position and may be placed either inside or outside the cold area, but there must never be any restriction, such as a hand expansion valve or a distributor, in the line between the valve and the evaporator unless the valve is provided with an external equalizing tube.

An external equalizing tube connecting the external equalizing port in the valve to an opening in the suction line just beyond the remote bulb location should always be used when there is a pressure drop of more than 4 lbs. between the valve outlet and the remote bulb location, or when the maximum superheat must be very low.

Valves will be tapped ⅛ in. I.P.S. for external equalizer without extra charge when so ordered; or they may be converted in the field by closing the internal equalizing port in the valve cage and tapping the external port in the cage cover.

External equalizing tubes must permit free passage of gas, and can be made up from tubing and fittings purchased locally.

Where series "T" thermo valves with solder line connections are used, remove the valve cage, power assembly, and all gaskets before making the solder connections.

A separate filter of adequate capacity is urgently recommended for installation directly ahead of each valve, manifold, or combination, regardless of any master filter that may exist elsewhere in the system.

A full-opening, hand-operated, stop valve is recommended for installation both ahead of and behind each valve or combination.

The remote bulb must always be attached to, or inserted in, the suction pipe near the outlet from the evaporator.

Before attaching an external remote bulb to any surface, clean that surface thoroughly with an abrasive and apply aluminum paint if the surface is iron or steel.

See that the entire length of remote bulb makes contact with the surface, then attach firmly with the clamps supplied.

A horizontal position on top of the pipe is preferable, and the remote bulb together with the pipe to which it is attached should be covered with adequate insulation.

Insert remote bulbs or line section remote bulbs are urgently recommended for all applications, particularly "short pass" evaporators; or where the remote bulb is subject to high velocity air or other media; or where the temperature surrounding the remote bulb is not comparable to the requirement; or where the actuating superheat must be very low.

Apply insert bulbs through one end of a tee in the suction line.

Never install either type of remote bulb in any location where liquid refrigerant will trap. Handle capillary tubing carefully.

Be sure the system is thoroughly clean and dry before attaching valves. Never blow the system with thermo valves in the line. Be sure there is plenty of refrigerant in the system, and that the liquid temperature at the thermo valve inlet is lower than the saturated liquid temperature for the corresponding pressure with the refrigerant used. This insures refrigerant reaching the valve in a liquid state.

Regulation

While Alco thermo valves may be had for any specified degree of actuating superheat from 1° to 24° F., the factory setting, unless otherwise specified, is at 5° F. for air conditioning, or 10° F. for product cooling. All factory superheat settings are with 35° suction gas.

Increasing the adjusting spring compression causes the valve to control at a higher superheat. Decreasing the spring tension permits the valve to control at a lower superheat.

To change the actuating superheat on types TL, TAL, and TBL, remove the cap screws connecting the power assembly to the body; pull out the valve cage assembly from the cage cover; and rotate the hexagon adjusting nut on the threaded stem.

One complete turn will raise or lower the actuating superheat approximately 3.5° F. at 0° F. suction temperature, or 1.5° F. at 45° F. suction temperature.

To change the actuating superheat on types TCL, TDL, and TEL, remove only the seal cap on the side of the valve, then turn the adjusting screw with a small screw driver. Turning to the right raises superheat, while a left turn lowers it. Four complete turns will raise or lower the actuating superheat approximately 3.5° at 0° F. suction temperature, or 1.5° at 45° F. suction temperature.

An alternate or auxiliary means of changing superheat at the evaporator outlet is to move the remote bulb. Moving the bulb back toward the valve increases the superheat; moving it farther from the valve decreases superheat.

To obtain highest efficiency from an evaporator, operate thermo valves at the lowest superheat possible without flooding back to the compressor.

Adjust each valve separately and wait between each adjustment to observe all results. Always tighten any loosened connections and replace removed seal caps.

Thermo valves are not stop valves. They can not be closed by hand.

External Valves

Fig. 3—Thermo valve used singly with line section remote bulbs.

Valve Selection

To select the proper valve for any refrigerated unit, divide the B.t.u. per hour load of that unit by 12,000. The answer will give you the required tonnage rate. The proper valve will be the one indicated in the Alco table of capacities as having a maximum rate of capacity equal to or slightly in excess of the requirement with the refrigerant, and under the pressure difference existing across the valve. In case of doubt, select a valve of ample but not excessive capacity.

Do not attempt to determine the pressure difference across a thermo valve by using only the difference between gauge pressures at the high and low sides of the compressor. Use one test gauge at the valve inlet and another at the valve outlet to determine exact pressure difference.

Where the pressure difference across a thermo valve must be calculated, approximate accuracy may be obtained as follows:

To calculate the liquid pressure at the valve inlet, start with the liquid pressure at the receiver outlet, deduct for friction losses in the run of line as well as intermediate hand valves and fittings; and if the evaporator is higher than the receiver, deduct 5 lbs. for each 13 ft. of vertical lift with CH_3Cl, or 5 lbs. for each 9 ft. of vertical lift with Freon.

To calculate the suction pressure at the valve outlet, start with the gas pressure corresponding to the gas temperature required for the transfer of the cooling load, then add any pressure drop caused by a distribution system or other restriction existing between the valve outlet and the location of the remote bulb.

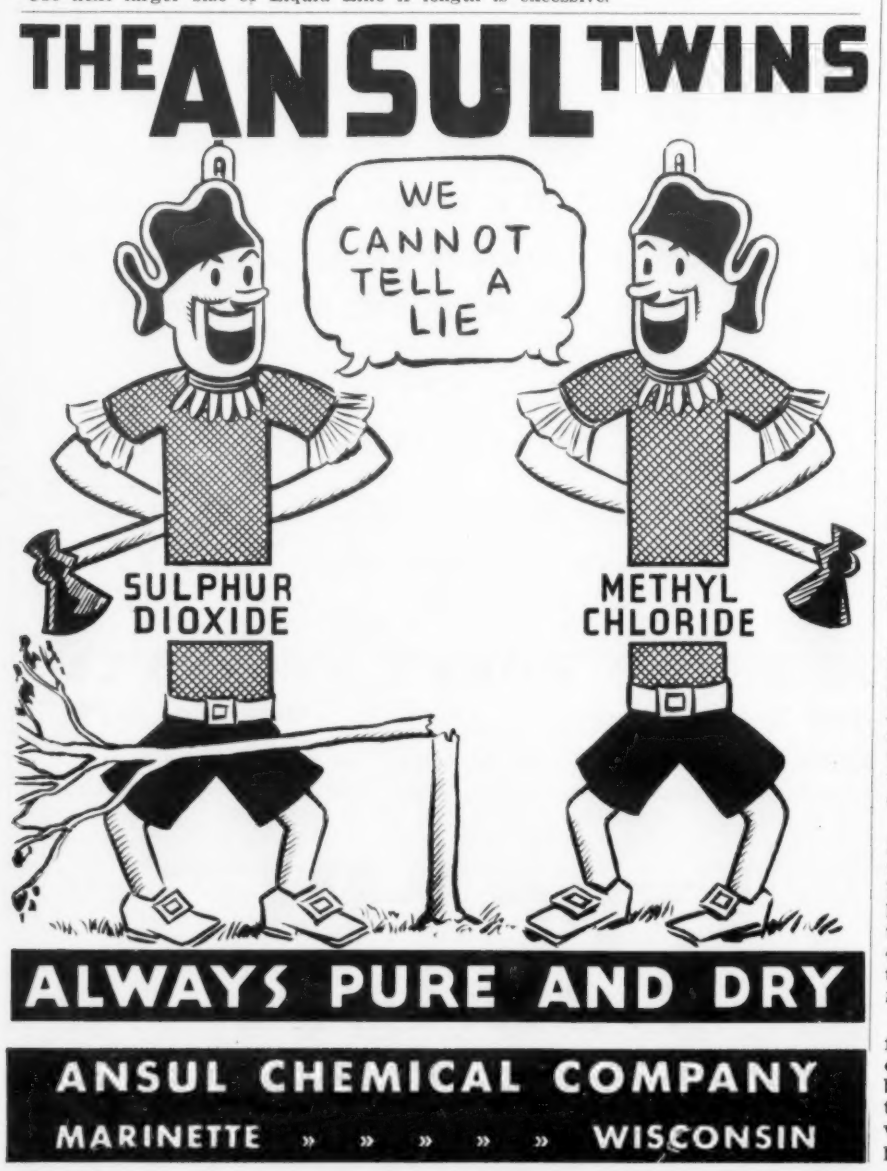
Be sure the liquid temperature at the thermo valve inlet is lower than the saturated liquid temperature for the corresponding pressure with the refrigerant used. This insures refrigerant reaching valve in a liquid state.

Recommended Sizes of Liquid Line

For Various Tonnages With CH_3Cl and F-12 and with Average Number of Full Flow Fittings

*Size O. D. Copper Pipe	¼"	⅜"	½"	⅝"	¾"	⅞"	1⅛"
Maximum Tons CH_3Cl	1½	4	7½	12	18	25	40
Maximum Tons F-12 (Freon)	½	1½	3	5	7½	10	15

*Use next larger size of Liquid Line if length is excessive.



THE SWING IS TO "M & E"
Steady Growth
over a ten-year period, in which "M&E" Compressors have been adopted as standard equipment by scores of America's largest and most responsible assemblers, is a gratifying result of the "M&E" policy of quality construction.
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BARE and COMPLETE COMPRESSORS
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FOR SO² • CH₃CL • F-12
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Letters From Service Men

Service Manuals Are On Their Way

I have read the introduction to the MASTER SERVICE MANUAL and found it to contain much valuable information. I am anxious to see the complete book of which I ordered a copy when I subscribed to ELECTRIC REFRIGERATION NEWS. Can you tell me when I will receive the MASTER SERVICE MANUAL?

Kindly add my name to the catalog mailing list maintained by you.—H. F. DeHart, 16 Wellington Place, New Brunswick, N. J.

Answer: The delay in completion of the MASTER SERVICE MANUAL has been embarrassing to us, but the six weeks' extra time spent in producing the book have served to make it a *much better manual* than it would have been if we had rushed the job through on schedule. You should receive your copy by the time this issue of the NEWS arrives.

Refrigerant Pressures

Box 418, Park Ridge, N. J.

Editor:

I would appreciate it very much if you will please verify the following data for me, and also supply me with the data that I have missing.

Are these the proper operating and cut-in pressures at 5° and 28° F., for the refrigerants listed?

	Operating	Cut-In
Sulphur Dioxide	5.6"	6.0 lb
Methyl Chloride (Artic)	6.0 lb	20.0 lb
Ethyl Chloride	20.5"	12.2 lb
Dichloromethane (Methylene Chloride) (Carrene No. 1)	27.5"	24.3"
Methyl Formate	26.5"	22.3 lb
Isobutane (Freezol)	3.3"	6.8 lb
Trichloromonofluoromethane (Carrene No. 2) (F-11)	24.0"	
Dichlorodifluoromethane (Freon) (F-12)	12.0 lb	27.0 lb
Dichloromonofluoromethane (F-21)	18.9"	
Dichlorotetrafluoroethane (F-114)		
Trichlorotrifluoroethane (Carrene No. 3) (F-113)		

FRANK GIANONATTI.

Answer: We are indebted to R. J. Thompson, chief engineer of Kinetic Chemicals, Inc., for his courtesy and cooperation in supplying the answer to this problem.

Mr. Thompson gives the following as the pressures under the stated conditions:

	Pressure Cut-Out 5° F.	Cut-In 28° F.
Dichlorodifluoromethane (Freon) (F-12)	11.8 lb	26.9 lb
Methyl Chloride (Artic)	6.2 lb	19.3 lb
Sulphur Dioxide	5.9"	6.0 lb
Isobutane (Freezol)	3.3"	6.8 lb
Dichloromonofluoromethane (F-21)	19.0"	10.6"
Ethyl Chloride	20.3"	13.0"
Trichloromonofluoromethane (Carrene No. 2) (F-11)	23.9"	19.1"
Methyl Formate	26.3"	22.6"
Dichloromethane (Methylene Chloride) (Carrene No. 1)	27.3"	25.0"
Trichlorotrifluoroethane (F-113)	27.5"	25.8"

Slack Period Welcomed

406 S. Broad St.
Trenton, N. J.

Editor:

Please change my address on your files from 209 Parkway Ave. to 406 S. Broad St., Trenton, N. J.

For your information I have been in business two years. I service 45 commercial machines and about 600 private boxes. I do nearly all my own work and keep busy except January and February, but I need a rest after working night and day the other 10 months.

Will you add my name to your list of independent service men? Please send the REFRIGERATION NEWS to this new address. I have just opened a small shop here as the location is central and the rent low.

MERLE A. ELDRIDGE.

Want Service in Wichita?

Soderberg Refrigeration Service and Supplies
341 N. Market
Wichita, Kansas
Jan. 23, 1936.

Publisher:

I notice in REFRIGERATION NEWS that different refrigeration manufacturing companies are wanting a list of independent service men.

Would be glad to cooperate with any manufacturer having any equipment in this vicinity.

CARL E. SODERBERG.

5 Books and a Subscription —All for Ten Dollars

Orville C. Kaufman
Electric Refrigeration Service and Supplies
319 North Miller St.
Santa Maria, Calif.
Jan. 28, 1936.

Publisher:

Find enclosed check for $10.00 for the following books: Two of the MASTER SERVICE MANUAL, two of the REFRIGERATION ENGINEERS MANUAL, one REFRIGERATION AND AIR CONDITIONING SPECIFICATIONS and a year's subscription to the NEWS, starting when my present subscription runs out.

Please add our name to your mailing list. ORVILLE C. KAUFMAN.

Answer: Thanks for your $10.00 order and remittance at the combination rate as offered. We'll add your name to the list for the Catalog Mailing Service as requested.

St. Louis Service Men Want Catalogs

St. Louis Chapter R. S. E. S.
2145 67th St., St. Louis, Mo.
Jan. 25, 1936.

Editor:

We have received numbers of requests by members of our chapter for catalogues from various manufacturers, and feel this can be best handled by inclusion of these names in the directory of catalogue service you are now compiling, and with this in mind we are enclosing names and addresses of those interested. As others may also wish to be included we shall advise you from time to time.

Trusting it is not too late to include this group of names and thanking you for this service. E. A. PLESSKOTT, President.

C.O.D. Orders on Books

John F. Vidovich
Certified Refrigeration Technician
12728 S. Lincoln St.
Blue Island, Ill.

Publisher:

I am a subscriber to your fine newspaper which keeps me in step with the industry.

Kindly place my name on the mailing list for catalogs which I will appreciate receiving from time to time.

For the past 12 years I have been connected in cold storage food preservation, have also graduated from the Utilities Engineering Institute of Chicago, and am now stepping out into this field of opportunity having the knowledge of both refrigeration and cold storage.

I am looking forward for my copy of the MASTER SERVICE MANUAL which I have asked you to mail me C.O.D. If you wish me to send cash or money order please advise me and I will gladly forward it.

JOHN F. VIDOVICH.

Answer: Thanks for your comment and your order. We will appreciate your kindness in sending remittance for the MASTER SERVICE MANUAL. We find that it seriously complicates the job if shipments are made by C.O.D. mail. By eliminating all unnecessary sales and clerical expenses, we are able to give subscribers *more service* in our publications.

Want Wholesale Connections

Please add our name to your Catalog Mailing Service.

We handle refrigerator parts and supplies to dealers and service men and are interested in contacts on a jobber or wholesale basis in connection with refrigeration equipment.—Shores Bros. (Radio Sales and Service), 313 Main, McCook, Nebr.

More Requests for the Catalog Mailing Service

Koch Butchers' Supply Co.
General Offices and Factory
600 East Fourteenth Ave.
North Kansas City, Mo.
Feb. 12, 1936.

Publisher:

Will you kindly add our name to your catalog mailing list. We are a subscriber of your publication.

C. LITMAN.

Please enter my name on your Catalog Mailing Service List.

As a new subscriber, I have already found out that the NEWS really lets you know what's what in the refrigeration and air conditioning field.—James R. Stewart, 104 Hiram St., Wallaceburg, Ont., Canada.

Will you kindly add my name on the manufacturers' mailing list for catalogs, literature, etc.

I am an independent installation and service man and a constant reader of ELECTRIC REFRIGERATION NEWS, which really is a great paper. Keep up the good work and thanks to the entire staff.—Stanley Shoemaker, 8053 Dubay, Detroit, Mich.

Please enter my name on your mailing list to receive catalogues and literature which you receive from manufacturers from time to time, and if there is any small charges on these mailing services that you are forming I'll be glad to pay it.

I am a subscriber to your paper.—Leo Thomas, Service man, 1238 S. Fairfield Ave., Chicago, Ill.

I am a subscriber to your paper and feel it is the best paper I have ever read.

Kindly enter my name on your catalogue mailing list.—L. S. Blystone (Refrigeration Technician. All Makes of Electric Refrigerators Installed—Serviced—Repaired), 802 Highland N. E. (Rear), Canton, Ohio.

Please include me on your catalog mailing list.—Frank Bonieski, 760 Cortland St., Perth Amboy, N. J.

Enclosed is $5.00. Please send me weekly issues of ELECTRIC REFRIGERATION NEWS for one year and one MASTER SERVICE MANUAL.

I would appreciate it if you will add my name to your list of catalog mailing service.—T. A. Kolas, 3906 North Christiana Ave., Chicago, Ill.

Please enter my name to your list in the Catalog Mailing Service. Would hate to miss the ELECTRIC REFRIGERATION NEWS, as it is a real help and won't miss it if I can possibly help it. Thanks.—Jones Electric & Refrigeration Service (Wiring, all kinds—Electrical Refrigeration Repairs and Installations, all makes), 4208 Leavenworth St., Omaha, Nebr.

Please include us in the list of Independent Service men of your next issue of REFRIGERATION DIRECTORY. Also put us on the Catalog mailing list. We recondition and service all makes refrigerators.—Stelton Products Co., Inc., Stelton, N. J.

We would like to be placed on your mailing list to receive catalogs and trade literature from manufacturers. Would also like to have you place our name on the independent service men's list.—James H. Schaperow, Mgr., Schaperow Refrigeration Co., 58 Denison Ave., New London, Conn.

Please enter our name on your mailing list for catalogs and other literature. We operate as an independent service company and service household and commercial refrigerator units.—Adolph H. Kohnert, Mgr., Dutchess Repair Service, Franklin Ave., Millbrook, N. Y.

Kindly place us on catalogue mailing list.—Refrigeration Service Co., 322 Eglinton Ave., E., Toronto, Ont., Canada.

I am a subscriber to the ELECTRIC REFRIGERATION NEWS, and would appreciate your adding my name to the Catalogue mailing service list.—Harold T. Schmitzer, 4900 Bergen St., Brooklyn, N. Y.

Do service men want catalogs? I'll say so. Kindly place me on your mailing list to receive same.—Maurice H. Schwartzberg, 512 E. Taylor St., Syracuse, N. Y.

Plumbing Jobber Adds Line Of Refrigeration Supplies

PATERSON, N. J.—White & Shauger, Inc., plumbing and heating jobbers here, report a broadening of its business scope to include jobbing refrigeration supplies for commercial, domestic, and air conditioning.

The addition of refrigeration supplies to the recent aquisition of electrical supplies and oil burner accessories will give the company a complete line of accessories.

INFORMAL TALK NUMBER 38

First in the Hearts of Smart Dealers

The universal reverence of Washington as the father of his country is proof of his great leadership and capabilities. And the acceptance of R-A-C-I by the Refrigeration and Air Conditioning and the Heating and Ventilating Industries is proof of R-A-C-I leadership and its ability to best train the men these industries need.

More than thirty leading manufacturers have now officially endorsed R-A-C-I Training. These manufacturers, thru an industry-appointed Board of Governors, are actually supervising and directing our entire Training Program. Their own engineers make our Training fit the Industry's every need. No other school in this field enjoys this kind of cooperation.

Employers—ambitious men—Write for the facts about this remarkable training.

The REFRIGERATION AND AIR CONDITIONING INSTITUTE
2130-2158 LAWRENCE AVENUE • CHICAGO

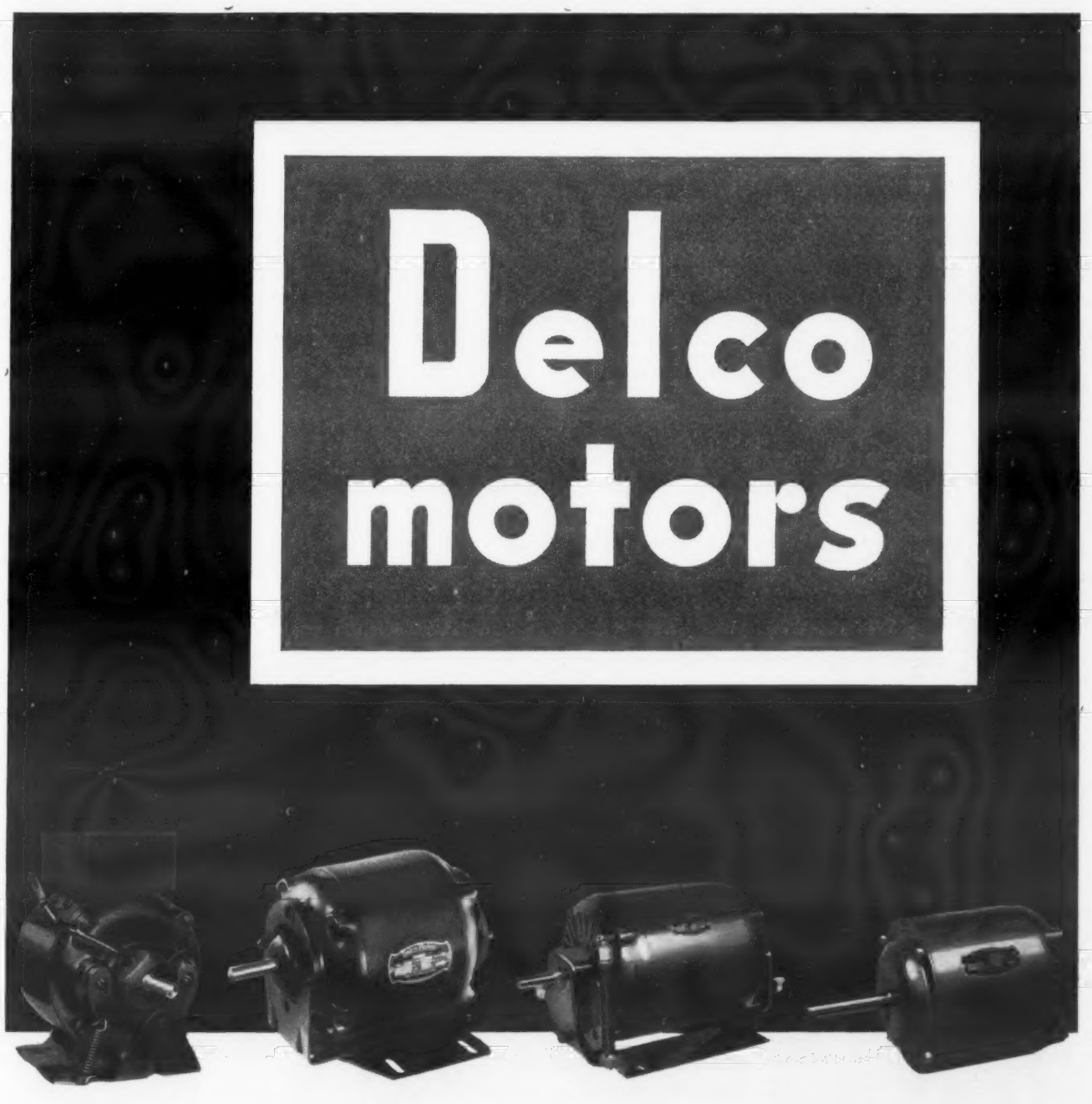
The Officially Endorsed School

WHOLESALE PARTS

Our 1936 catalog lists complete wholesale supplies for commercial and household refrigeration. Write for your copy today. Indiana's complete wholesale refrigeration parts warehouse.

"Our stock today is on your job tomorrow."

F. H. LANGSENKAMP COMPANY
229 E. South St.
Indianapolis, Indiana



The reputation of any household appliance depends largely on the reliability of the motor which operates it. Delco motors, with years of dependable service to their credit, are known to prospective buyers for their efficient and quiet operation. And as a result, the men who sell Delco-powered appliances meet with no sales resistance—for buyers feel certain that a Delco-equipped product will surely give them the trouble-free service they want. That is why appliance manufacturers choose Delco motors, and why experienced dealers prefer to sell products that are equipped with Delco motors.

Made in Canada by McKinnon Industries, Ltd., St. Catharines, Ontario

DELCO PRODUCTS CORPORATION • DAYTON, OHIO

California Salesmen Visit Crosley Plant

CINCINNATI — Salesmen from Chanslor & Lyons Stores, Inc., Los Angeles and San Francisco, Crosley distributor in California, together with N. J. Etienne, manager of the radio and refrigerator department, visited the Crosley factory recently to get new selling ideas for 1936.

The salesmen who were entertained by Crosley heads were: Robert DeVille, Mel Dollinger, William Hocking, K. Timson, F. S. Earlywine, M. M. Pettis, M. Roberts, and William J. Barron. Others in the group were U. S. Grant, San Diego, Cal., one of the largest Crosley dealers in the state, and Paul W. Bialkowsky, Crosley western division manager.

The party was conducted through the factory by Neil Bauer, manager of the special products division; J. D. Park, manager of the Crosley dealer department; and Lee Bird, field service manager.

A trip to one of Cincinnati's cafes and to a night club was taken in the company of Powel Crosley, Jr., president; J. P. Rogers, vice president; H. E. Richardson, general sales manager; Glenn Corbett, advertising manager; and Robert Perkins, distribution manager.

The entire group also saw the 500,000-watt WLW transmitter, the world's most powerful broadcasting station, at Mason, near Cincinnati.

'36 Conservador Line Shown in 5 Cities

CHICAGO—Dealers in Pittsburgh, Des Moines, Cincinnati, Omaha, and Denver saw the 1936 line of Fairbanks-Morse refrigerators at dealer meetings in those cities recently.

H. L. Bear, eastern district sales manager, was present at the Logan, Gregg & Co. "open house" in Pittsburgh, and also at the three-day special showing conducted by Appliances, Inc., Cincinnati distributor.

Bob Anderson, district representative for the home appliances division, reports a large attendance at meetings of both the Robert F. Clark Co., Denver, and Herring-Wissler Co., Des Moines.

Kahn to Manage Chicago District of G-E Supply

CHICAGO—Appointment of A. H. Kahn as district manager of the General Electric Supply Corp. here, was announced recently by J. L. Busey, president. Kahn formerly held the position of Pacific Coast operating manager of the G-E Supply Corp., San Francisco.

Hitchcock Joins Frankelite

CLEVELAND—H. I. Hitchcock has joined the Frankelite Co., Crosley distributor here, as merchandising adviser and dealer assistant. He will contact dealers and assist them in their sales and sales-promotion activities.

7 'Talking Kitchens' Are Built for Use Of G-E Dealers

CLEVELAND—Seven General Electric "talking kitchen" displays are being made available for use of the G-E distributing organization, as a result of the widespread interest which this promotional feature has created, declares A. L. Scaife, sales promotion manager.

Two talking kitchen set ups have been fitted to automobile trailers and are already being routed from one city to another. Five similar displays are being booked by department stores, utility companies, newspaper cooking schools, conventions, fairs, and exhibits, Mr. Scaife claims.

The talking kitchen is equipped with G-E refrigerator, range, dishwasher, and kitchen work surfaces. Each appliance is synchronized with a sound and action device.

By opening the door or lid of the appliance, the sound control is released and a recorded voice relates the selling points of the appliance. C. O. Hamlin of the General Electric sales promotion department perfected the idea of the talking kitchen.

Twenty-seven leading department stores situated throughout the United States have already exhibited a G-E talking kitchen. Included among them was Macy's, New York, where it was shown for six months; J. L. Hudson Co., Detroit; May Co., and Wm. Taylor Son & Co., Cleveland; and Marshall Field & Co., Chicago.

The display has also been shown by 14 utilities, and it has had space in the following fairs and exhibitions: New York House Furnishing Show, Canadian National Exposition at Toronto, Western Washington State Fair, San Diego Exposition, Cincinnati Electrical Progress Exposition, Hartford Better Homes Exposition, New York Housing Show, Altoona Food Show, American Home Economics convention, and the National Retail Dry Goods Association convention.

Dyer to Direct Sales of S-W Auto Radios

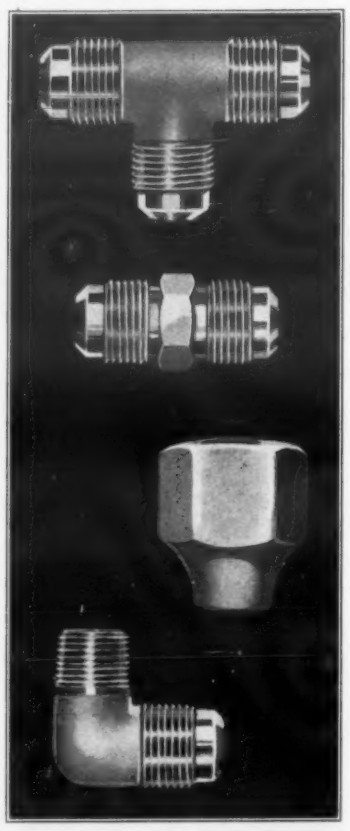
CHICAGO—Walter H. Dyer, for many years vice president and director of sales for the U. S. Radio & Television Corp. of Marion, Ind., and more recently a director of General Household Utilities Co., in charge of automotive and contract radio department, has joined the Stewart-Warner Corp. as sales manager of the automobile radio set division.

Lady Named District Head For Frigidaire Corp.

TOPEKA, Kan.—L. R. Lady, manager of the electrical department of Karlan's here for the past three years, has been appointed district representative for Frigidaire Corp.

Mr. Lady will have headquarters here and will represent Frigidaire in northeastern Kansas.

IMPORTANT



Certainly, fittings are important. They must be tight or the installation fails—no job is any better than the joints throughout its assembly.

When Commonwealth fittings are put to work the danger from seepage or leakage of refrigerants is removed.

Why this is so can be easily understood when any Commonwealth fittings are carefully examined. The precisely cut threads, exact taper of seats and the definite density of metals used are only three of the many reasons for their satisfaction in service.

What counts most, perhaps, is the settled policy and determination of Commonwealth to produce, *always*, Seepage Proof Fittings.

BUILT RIGHT
TO STAY TIGHT

COMMONWEALTH BRASS CORP.
Commonwealth at Grand Trunk R.R.
DETROIT, MICH.

Patents

Issued Jan. 21, 1936

2,028,213. HEAT EXCHANGER OR COOLER. Arthur R. Hemphill, Egg Harbor City, N. J. Application April 21, 1933, Serial No. 667,167. 3 Claims. (Cl. 62—126.)

2,028,444. HUMIDIFIER. William Feldermann, South Orange, N. J. Application Sept. 1, 1934, Serial No. 742,514. 4 Claims. (Cl. 261—91.)

2,028,456. REFRIGERATING APPARATUS. John Karmazin, Huntington, Ind., assignor to Karmazin Engineering Co. Application May 7, 1935, Serial No. 20,202. 4 Claims. (Cl. 257—255.)

2,028,458. REFRIGERATING APPARATUS. John Karmazin, Huntington, Ind., assignor to Karmazin Engineering Co. Application May 7, 1935, Serial No. 20,204. 6 Claims. (Cl. 257—255.)

2,028,562. PLATE HEAT EXCHANGER. Edwin Prestage, London, England. Application Aug. 28, 1935, Serial No. 38,250. In Great Britain May 25, 1934. 5 Claims. (Cl. 257—245.)

2,028,565. REFRIGERATING SYSTEM. Siegfried Ruppricht, New York, N. Y. Application March 18, 1931, Serial No. 523,471. 12 Claims. (Cl. 62—4.)

2,028,584. REFRIGERATING MACHINE. Harley H. Bixler, Schenectady, N. Y., assignor to General Electric Co. Application Jan. 11, 1935, Serial No. 1,338. 14 Claims. (Cl. 230—235.)

2,028,735. REFRIGERATING SYSTEM. Franklin B. Hunt, Chicago, Ill., assignor to The Liquid Carbonic Corp., Chicago, Ill. Application April 24, 1931, Serial No. 532,439. 18 Claims. (Cl. 62—115.)

Issued Jan. 28, 1936

2,028,814. AIR CONDITIONER. John C. Wichmann, Chicago, Ill. Application Sept. 26, 1932, Serial No. 634,871. 16 Claims. (Cl. 62—154.)

2,028,824. COMPRESSOR FOR REFRIGERATING SYSTEMS. John C. Buchanan, Detroit, Mich., assignor, by mesne assignments, to Borg-Warner Corp. Application Oct. 9, 1933, Serial No. 692,727. 8 Claims. (Cl. 230—205.)

2,028,893. MEANS AND METHOD FOR CONTROLLING REFRIGERATOR TEMPERATURE. Carlton W. Bondurant, Cleveland, Ohio, assignor to The Bishop & Babcock Mfg. Co., Cleveland, Ohio. Application Oct. 4, 1932, Serial No. 636,160. 15 Claims. (Cl. 200—81.)

2,028,926. WATER COOLER FOR REFRIGERATORS. Walter G. Seeger and Robert S. Ahrens, St. Paul, Minn., assignors to Seeger Refrigerator Co., St. Paul, Minn. Application Feb. 14, 1930, Serial No. 428,387. 19 Claims. (Cl. 62—141.)

2,028,943. METHOD OF FORMING REFRIGERATOR LININGS. Roland H. Money, Cincinnati, Ohio, assignor to The Crosley Radio Corp., Cincinnati, Ohio. Application Sept. 20, 1935, Serial No. 41,502. 3 Claims. (Cl. 113—120.)

2,029,109. REFRIGERATING APPARATUS. Andrew A. Kucher, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio. Application Aug. 31, 1933, Serial No. 687,622. 15 Claims. (Cl. 62—34.)

2,029,153. REFRIGERATION PROCESS AND APPARATUS. James A. Burner, Minneapolis, Minn., assignor to Air Systems, Inc., Minneapolis, Minn. Application Aug. 30, 1929, Serial No. 389,486. Renewed Nov. 16, 1933. 8 Claims. (Cl. 62—171.)

2,029,175. PORTABLE REFRIGERATOR. Sylvester A. Limpert, Bay Shore, N. Y., assignor to Mechana Kold Corp., Bay Shore, N. Y. Application Dec. 4, 1933, Serial No. 700,789. 9 Claims. (Cl. 62—116.)

2,029,263. REFRIGERATING APPARATUS. Lloyd M. Keighley, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio. Application Nov. 18, 1933, Serial No. 698,655. 19 Claims. (Cl. 62—126.)

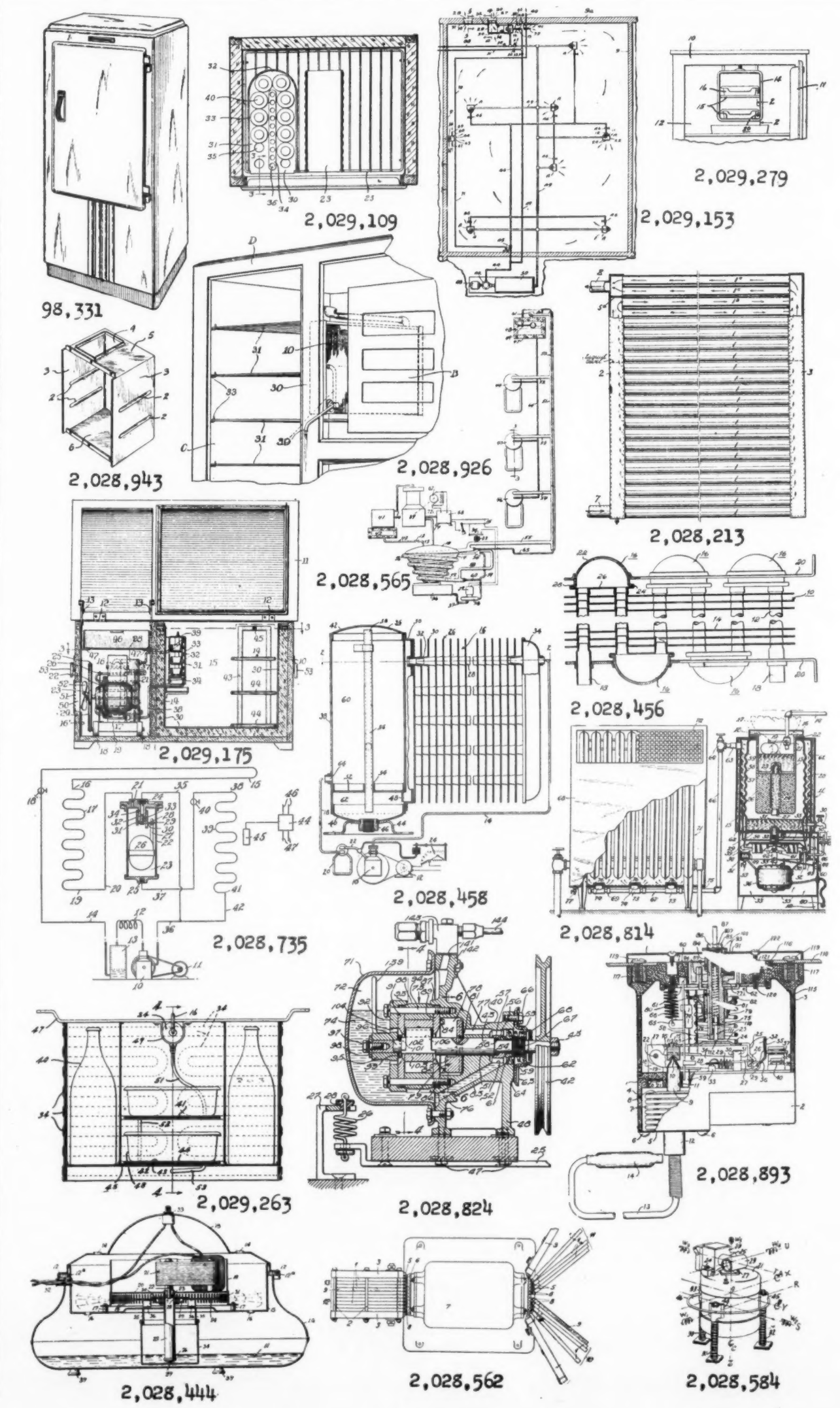
2,029,279. REFRIGERATING APPARATUS. Carl A. Stickel, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio. Application June 27, 1934, Serial No. 732,682. 9 Claims. (Cl. 62—108.5.)

DESIGNS

98,331. DESIGN FOR A REFRIGERATOR CABINET. Ralph E. Kruck, Springfield, Mass., assignor to Westinghouse Electric & Mfg. Co. Application April 23, 1935, Serial No. 56,522. Term of patent 7 years.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.



The Refrigeration Engineer's Manual

By S. L. Potts

Figuring Values for Expansion And Compression of Gases

Chapter 4—Compression of Gases (Continued)

Isothermal expansion and compression of gases takes place when the temperature of the compressed or expanded gas does not change during the process of compression or expansion. That is the compression or expansion of the gas takes place without a change of temperature.

In order to have a constant temperature in the gas, during compression, heat must be removed from the gas as fast as it is generated by the work of compression. This is the function of the water jacket on the compressor.

In order to have the temperature of the gas remain constant during expansion, heat must be added to the expanding gas. This is the function of the steam jacket or steam engine cylinders. If the temperature of the gas remains constant, the state or condition can be expressed by the formula:

$P \times V = \text{constant}$. (This is true of all states.)

This change for expansion of gas can be plotted on a curve thus.

Expansion Curve

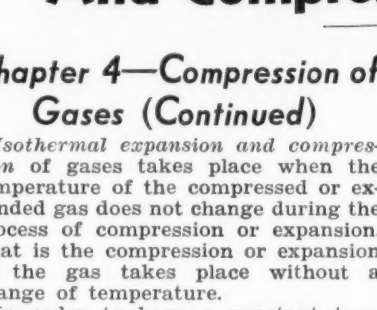


Fig. 41—Chart shows how, with temperature constant, volume varies inversely with pressure.

Problem. Assume that we have 1 volume of a gas at 100 lbs. absolute pressure. Figure the values for other volumes.

$$P \times V = \text{Constant or } P = \frac{\text{Constant}}{V}$$

$100 \times 1 = 100$

For 2 volumes

$$P_2 = \frac{100}{2} = 50 \text{ lbs. pressure absolute.}$$

For 3 volumes

$$P_3 = \frac{100}{3} = 33.33 \text{ lbs. pressure.}$$

For 4 volumes

$$P_4 = \frac{100}{4} = 25 \text{ lbs. pressure.}$$

The same values can be made for compression of a given volume of gas thus.

Problem. Assume that we have 100 cu. ft. of gas at 15 lbs. pressure that we want to compress to 20 cu. ft.

For 1 volume

$P_1 \times V = 100 \times 15 = 1500$ constant.

For ½ volume

$$P_2 = \frac{1500}{50} = 30 \text{ lbs. pressure absolute.}$$

For ⅓ volume

$$P_3 = \frac{1500}{33.3} = 45 \text{ lbs. pressure.}$$

For ¼ volume

$$P_4 = \frac{1500}{25} = 60 \text{ lbs. pressure.}$$

For ⅕ volume

$$P_5 = \frac{1500}{20} = 75 \text{ lbs. pressure.}$$

Adiabatic expansion and compression is the expansion or compression of a gas inside some container that would not permit any heat to enter or leave through the cylinder walls while the expansion or compression of the gas was taking place. That is, no heat can be added or removed from the gas.

In adiabatic expansion, some of the heat contained in the gas is used for the expansion which will lower the temperature of the gas after expansion is complete.

Adiabatic compression causes a rise in temperature because the work performed in compressing the gas appears as heat in the gas. As no heat can leave the cylinder, a rise of temperature must follow the compression.

Adiabatic expansion and compression cannot be attained in actual working conditions because there is no known material that does not permit of the passage of some heat through its walls. Adiabatic expansion and compression may be expressed as

$$P \times V^n = \text{constant}.$$

The compression of any gas usually takes place in a water jacketed cylinder. The purpose of the water jacket is to reduce the temperature of the gas during compression by removing some of the heat of compression through the walls of the cylinder.

It is found next to impossible to remove all the heat of compression with any kind of water jacket but the final temperatures of cylinder walls may be reduced sufficient to keep the final temperatures within safe limits. This is the result desired by using water jackets on air compressors. If water jackets were not used or the water turned off the jacket, the cylinder walls would increase in temperature rapidly. The compressed gases would be heated by the high temperature cylinder walls, in excess of the heat due to compres-

(*Concluded on Page 18, Column 3*)

Table 4—Values for V_2 for Expansion of Gases

Values For V_2	Values For $\frac{V_1}{V_2}$	Values for Gases: Air n—1.405	Ammonia n—1.3	CO_2 n—1.414	SO_2 n—1.247
		Values for Gases for $\frac{(V_1)^n}{(V_2)}$			
1.00	1.000	1.000	1.000	1.000	1.000
1.05	.9524	.9338	.9386	.9334	.9410
1.10	.9091	.8747	.8835	.8739	.8880
1.15	.8696	.8217	.8339	.8209	.8401
1.20	.8333	.7740	.7890	.7727	.7966
1.25	.8000	.7275	.7484	.7294	.7571
1.30	.7692	.6916	.7110	.6900	.7045
1.35	.7407	.6560	.6770	.6541	.6878
1.40	.7143	.6233	.6457	.6214	.6573
1.45	.6897	.5933	.6169	.5914	.6292
1.50	.6667	.5657	.5903	.5637	.6032
1.55	.6452	.5402	.5657	.5382	.5790
1.60	.6250	.5167	.5428	.5145	.5565
1.65	.6061	.4948	.5215	.4926	.5356
1.70	.5882	.4744	.5016	.4722	.5159
1.75	.5714	.4555	.4831	.4532	.4976
1.80	.5556	.4379	.4658	.4356	.4805
1.85	.5405	.4213	.4494	.4190	.4643
1.90	.5263	.4058	.4341	.4035	.4491
1.95	.5128	.3913	.4197	.3871	.4348
2.00	.5000	.3776	.4061	.3753	.4213
2.10	.4762	.3526	.3812	.3503	.3965
2.20	.4545	.3302	.3587	.3279	.3741
2.30	.4348	.3110	.3386	.3080	.3540
2.40	.4167	.2933	.3205	.2900	.3357
2.50	.4000	.2760	.3038	.2737	.3190
2.60	.3846	.2612	.2887	.2589	.3037
2.80	.3571	.2353	.2622	.2332	.2769
3.00	.3333	.2136	.2397	.2115	.2541
3.25	.3077	.1909	.2161	.1889	.2300
3.50	.2857	.1720	.1962	.1701	.2097
3.75	.2667	.1562	.1794	.1543	.1924
4.00	.2500	.1426	.1649	.1408	.1775
4.33	.2309	.1274	.1487	.1259	.1608
4.67	.2141	.1147	.1348	.1130	.1463
5.00	.2000	.1042	.1234	.1027	.1344
5.50	.1818	.0933	.1090	.0898	.1193
6.00	.1667	.0807	.0974	.0794	.1071
7.00	.1429	.0650	.0797	.0639	.0884
8.00	.1250	.0538	.0670	.0529	.0748
9.00	.1111	.0456	.0575	.0447	.0646
10.00	.1000	.0394	.0501	.0385	.0566
11.00	.0909	.0344	.0443	.0337	.0503
12.00	.0833	.0304	.0395	.0298	.0451
13.00	.0769	.0272	.0356	.0266	.0408
14.00	.0714	.0245	.0323	.0239	.0372
15.00	.0667	.0223	.0296	.0217	.0342
16.00	.0625	.0203	.0272	.0198	.0308
17.00	.0588	.0187	.0251	.0180	.0292
18.00	.0556	.0173	.0234	.0168	.0272

Table 5—Values for V_2 for Compression of Gases

Values For V_2	Values For $\frac{V_1}{V_2}$	Values for Gases: Air n—1.405	Ammonia n—1.3	CO_2 n—1.414	SO_2 n—1.247
		Values for Gases for $\frac{(V_1)^n}{(V_2)}$			
1.000	1.000	1.000	1.000	1.000	1.000
.950	1.053	1.075	1.069	1.076	1.067
.900	1.111	1.159	1.147	1.160	1.140
.850	1.176	1.256	1.235	1.257	1.224
.800	1.250	1.368	1.337	1.371	1.321
.750	1.333	1.498	1.453	1.501	1.431
.725	1.379	1.571	1.519	1.575	1.493
.700	1.429	1.651	1.591	1.657	1.561
.675	1.481	1.736	1.666	1.742	1.632
.650	1.538	1.831	1.750	1.838	1.711
.625	1.600	1.977	1.842	1.944	1.797
.600	1.667	2.050	1.953	2.060	1.891
.575	1.739	2.176	2.053	2.187	1.994
.550	1.818	2.316	2.175	2.328	2.107
.525	1.905	2.473	2.311	2.487	2.234
.500	2.000	2.648	2.462	2.665	2.373
.480	2.083	2.804	2.596	2.822	2.497
.460	2.174	2.978	2.744	2.998	2.634
.440	2.273	3.170	2.908	3.193	2.784
.420	2.381	3.383	3.089	3.410	2.950
.400	2.500	3.623	3.291	3.653	3.135
.380	2.632	3.895	3.519	3.929	3.343
.360	2.778	4.202	3.774	4.241	3.575
.340	2.941	4.552	4.065	4.597	3.839
.320	3.125	5.069	4.490	5.009	4.141
.300	3.333	5.427	4.783	5.487	4.487
.290	3.448	5.692	4.999	5.756	4.681
.280	3.571	5.980	5.231	6.049	4.890
.270	3.704	6.295	5.486	6.369	5.118
.260	4.846	6.636	5.761	6.717	5.364
.250	4.000	7.013	6.063	7.101	5.633
.240	4.167	7.428	6.394	7.524	5.928
.230	4.348	7.885	6.757	7.806	6.109
.220	4.545	8.391	7.158	8.506	6.606
.210	4.762	8.960	7.605	9.087	7.002
.200	5.000	9.595	8.103	9.735	7.441
.190	5.263	10.312	8.661	10.467	7.932
.180	5.556	11.127	9.294	11.300	8.486
.170	5.882	12.056	10.001	12.249	9.112
.160	6.250	13.128	10.830	13.347	9.828
.150	6.667	14.375	11.779	14.623	10.652
.140	7.143	15.838	12.883	16.121	11.609
.130	7.692	17.575	14.186	17.900	12.732
.120	8.333	19.667	15.741	20.045	14.068
.110	9.091	21.917	17.400	22.671	15.682
.100	10.000	25.410	19.953	25.942	17.660
.090	11.111	29.463	22.881	30.109	20.139
.080	12.500	34.767	26.665	35.566	23.326
.070	14.286	42.127	31.718	42.958	27.553
.060	16.667	52.085	38.763	53.421	33.393
.050	20.000	67.290	49.129	69.129	41.916

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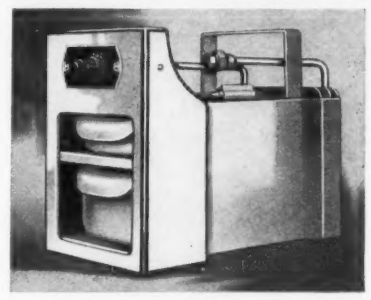

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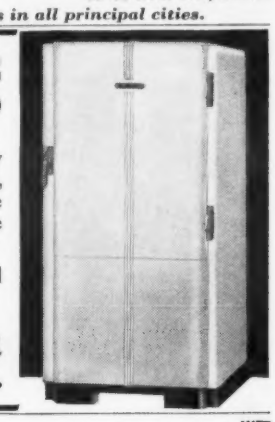

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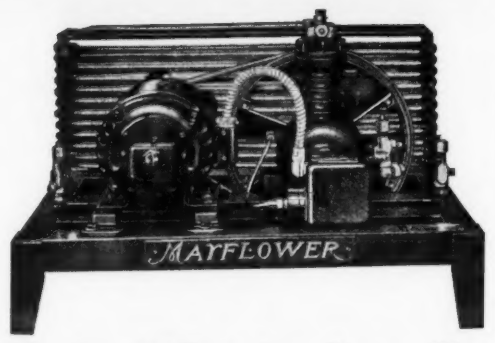

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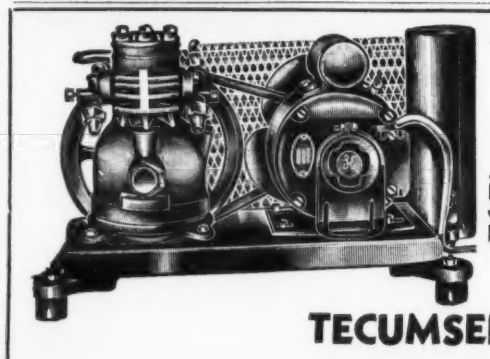

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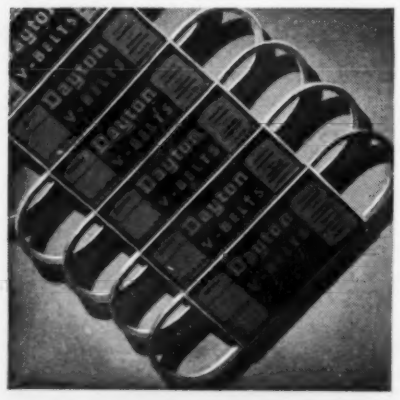

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(Concluded from Page 17, Column 3)

sion, and the final gas temperature would be much higher due to the accumulated effect.

The above formula states that when a gas is expanded or compressed adiabatically without adding or removing heat to or from outside, that the product of the absolute pressure and the volume of the Nth power is always equal to constant. It is the same product for all states of the gas.

This may be written thus:

$$P_1 \times V_1^n = P_2 \times V_2^n$$

$$P_2 = \frac{P_1 \ (V_1)^n}{(V_2)}$$

P_1 is the initial pressure absolute in pounds per square inch.

P_2 is the final pressure absolute in pounds per square inch.

V_1 is the initial volume in cubic feet or cubic inches.

V_2 is the final volume in cubic feet or cubic inches.

^{n} is the power of exponent to which the volumes must be raised. This value is found by dividing the specific heat at constant pressure by the specific heat at constant volume for air=1.405; NH_3=1.3; CO_2=1.414; SO_2=1.247.

This formula is used to figure the final absolute pressure on any gas after expansion or compression has taken place from the original volume (V_1). The values for the exponent (^{n}) varies for different gases.

If we want to find the volume of a gas after expansion or compression we use the formula as follows:

$$P_1 \times V_1^n = P_2 \times V_2^n$$

$$V_2^n = \frac{P_1 \times V_1^n}{P_2}$$

$$V_2 = \sqrt[n]{\frac{P_1 \times V_1^n}{P_2}} = V_1 \sqrt[n]{\frac{P_1}{P_2}}$$

$$V_2 = V_1 \sqrt[1.3]{\frac{P_1}{P_2}}$$

The value for ^{n} for ammonia is 1.3.

The value for the exponent (^{n}) in the formula given frequently becomes fractional and cannot be found or used in the usual way for squares and cubes of numbers. In order to obtain the values for fractional exponents, the use of logarithms must be understood. As a table of logarithms is not always at hand when needed, and as the use of the logarithms is not always understood, tables have been prepared to overcome this trouble. The tables containing the values for

$$\left\{\frac{V_1}{V_2}\right\}^n$$

for many values to enable the student to work out the expansion and compression problems without the use of logarithms.

Problem. Let us assume a problem to illustrate the use of the logarithms and the tables.

If 20 cu. ft. of ammonia gas at 175 lbs. pressure absolute is expanded to 160 cu. ft. what is the final pressure on gas? Using logs:

$$P_2 = P_1 \left\{\frac{V_1}{V_2}\right\}^n$$

V_2 is 160 cubic feet

V_1 is 20 cubic feet

P_1 is 175 pounds

$$P_2 = 175 \left\{\frac{20}{160}\right\}^{1.3} = 175(.125)^{1.3}$$

The logarithm of .125 is .09691—1.

This log .09691—1×1.3=.825983—2 This is the log of .06698

P_2=175×.06698=11.725 lbs. pressure absolute on gas.

Note: In using the log with the negative exponent, put it in the form of

Log of .125 is .09691—1 thus 9.09691—10 and this multiplied by the exponent 1.3 gives 11.825983—13 which is the log of .06698.

Using tables:

The formula is the same. Look for the value of

$$\left\{\frac{V_1}{V_2}\right\}^n$$

in the tables. Look in the table for the value 8 times the original volume or the ratio

$$\left\{\frac{V_1}{V_2}\right\}$$

and under the heading of NH_3 find the value of .0670. The original pressure (175)×.0670=11.725 lbs. pressure final.

(To Be Continued in Next Issue)

Dept. Store Adds G-E Line

OKLAHOMA CITY—John A. Brown department store here announced their recent appointment as General Electric refrigerator dealer with a full page advertisement showing the 15 G-E models they are carrying.

Table 6—Specific Heat of Materials

Substance Solids	Specific Heat	Substance Liquids	Specific Heat
Copper	.0951	Water	1.0000
Gold	.0316	Alcohol Grain	.6200
Wrought Iron	.1152	Alcohol Wood	.6009
Cast Iron	.1189	Mercury	.0333
Steel Soft	.1175	Benzine	.4500
Steel Hard	.1165	Glycerine	.5550
Zinc	.0935	Sulphuric Acid 1.87 G.	.3346
Brass Yellow	.0883	Sulphuric Acid 1.30 G.	.6614
Glass Common	.1988	Ammonia Anhydrous	1.0067
Lead	.0299	Lead Melted	.0402
Platinum	.0323	Sulphur Melted	.0637
Silver	.0559	Tin Melted	.0637
Tin	.0518	Turpentine	.4260
Sulphur	.2025	Olive Oil	.3096
		Proof Spirits 50% Alcohol	.9730

Gases	Constant Pressure C_p	Constant Volume C_v	Ratio of Specific Heat $C_p/C_v=K$
Air	.23751	.16902	1.405
Oxygen	.21751	.15507	1.403
Nitrogen	.24380	.17273	1.411
Hydrogen	3.40900	2.41226	1.413
Steam Superheat	.48050	.34600	1.389
Carbon Monoxide	.24790	.17580	1.410
Carbon Dioxide	.21700	.15350	1.414
Ammonia	.50800	.30030	1.298
Sulphur Dioxide	.15530	.12460	1.247

Table 7—Heat of Fusion and Vaporization

Substance	Temperature of Fusion Deg. F.	Temperature of Vaporization Deg. F.	Latent Heat of Fusion B.t.u.	Latent Heat of Vaporization B.t.u.
Water	32	212	144	970.2
Mercury	— 39	675	5.09	....
Sulphur	237.2	831	16.86	....
Alcohol	—202.9	173	....	372
Oil of Turpentine	14	313	....	124
Linseed Oil	....	600	....	....
Air	....	—312	....	....
Ammonia	—110	— 28	....	589.3
Carbon Dioxide	—160.6	—109	81.5	158.6
Sulphur Dioxide	....	14	....	168.83

Preceding Instalments Of Engineers Manual

Chapter I, starting in the Jan. 1, 1936, issue and continued in the Jan. 8 issue, explains the physical laws involved in the process of producing artificial refrigeration and the principal types of systems used. This introductory chapter also defines the terms and units of measurements used frequently in later discussions.

Chapter II, in the Jan. 15 issue gives a comprehensive survey of the characteristics of all the various chemicals which may be used as refrigerants, with the advantages and disadvantages of those most commonly selected in commercial practice.

Chapter III deals with compressors. The first instalment of Chapter III, published in the Jan. 22 issue, explained the function of compressors and the methods used in classifying them.

The second instalment of Chapter III, which appeared in the Jan. 29 issue, discussed the advantages and disadvantages of various types. The third instalment, appearing in the Feb. 5 issue, discussed pistons, piston rings, and suction and discharge valves.

Chapter IV, the first instalment of which appeared in the Feb. 12 issue, explained the theory involved in the compression of gases. The chapter is continued in this issue and will be concluded next week.

THE REFRIGERATION ENGINEERS MANUAL will be offered in book form about May 1, 1936. Approximately 300 pages. Price $3.00 per copy. The MANUAL in combination with a subscription to the NEWS costs $5.00 if check is sent with order.

Indirect Lighting Used In New St. Louis Store

ST. LOUIS—An aluminum indirect lighting system has been installed in the new store opened by Crosby Co., Kelvinator refrigerator and General Electric and Philco radio dealer at 2321 South Kingshighway here.

The new store, which is 24x55 ft. has walls and ceiling of light color tone and linoleum-covered floor. A complete line of Kelvinator electrical appliances will be carried by the company.

All Display Space for Cincinnati Electric Exhibit Is Sold

CINCINNATI—All available display space in the Fourth Annual Electrical Progress Exposition, to be held in the Union Central Annex from March 23 to 28, was subscribed for at a recent meeting of the Cincinnati Electrical Association. The Association, with the *Cincinnati Times Star*, will co-sponsor the exposition.

Refrigerators, radios, home laundry equipment, ranges, vacuum cleaners, and air-conditioning equipment will be on display in the exposition hall.

Firms exhibiting will include: Appliances, Inc.; Auto-Rad Supply Co.; Bard and Barger, Inc.; Crosley Distributing Corp.; General Electric Supply Co.; Graybar Electric Co.; Griffith Distributing Corp.; Harten-Knodel Distributing Corp.; Johnson Electric Supply Co.; Maytag Cincinnati Corp.; Tafel Refrigeration Co.; Schneider-Schott Co.; Schuster Electric Co.; Tri-State Distributing Corp.; Union Gas & Electric Co.; Althofer Brothers; and Eureka Vacuum Co.

Arrangements for the exposition will be under the direction of Eugene P. Zachman, manager of the association, show chairman; Harry J. Ulmer, *Times-Star*, show manager; Kenneth Magers, Union Gas & Electric Co.; and France M. Raine, *Times-Star*, publicity and promotion.

South Jersey Show to Open March 15

CAMDEN, N. J.—Isador Borstein, chairman of the refrigeration board of the Electrical League of South Jersey, reports that the league's annual spring refrigeration show will be held here between March 15 and April 4. Although the exact date has not yet been determined, the show is expected to last four days and nights.

New Crosley Distributor

WASHINGTON, D. C.—Simon Distributing Co., 2501 Avenue H, N. W. here has been appointed distributor for the Crosley Radio Corp. The company has just moved into its newly constructed building.

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GIVES SPEEDY SERVICE

You're always near a supply of ARTIC. Location doesn't matter. You can be on the Pacific Coast, in Oklahoma or New England—in a small town or large city. The ARTIC S.O.S. (Source-of-Supply) 53 stocking points in 46 cities, can take care of your requirements, promptly and on short notice. All of these points carry adequate stocks in standard containers.

ARTIC Service News lists authorized distributors and stocking points, gives current information about refrigeration.

DU PONT THE N. & H. CHEMICALS DEPARTMENT E. I. DU PONT DE NEMOURS & COMPANY, INC. Wilmington, Delaware

Classified

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

IF YOU are calling on refrigeration jobbers and distributors, we have an extremely interesting deal, providing territory is open. We can assure you it will be well worth your while to drop us a line advising what territory you are now travelling and full information about yourself. Betz Corp., Betz Bldg., Hammond, Ind.

POSITIONS WANTED

EXPERIENCED refrigeration man desires work with large distributor or dealer but preferably with manufacturer or parts factory in Middle West. Excellent technical training. Experienced with general layouts, installation and servicing of commercial and household units, water coolers, etc. (Married.) Address H. H. Binder, 216 E. Lincolnway, La Porte, Ind.

REFRIGERATION Service Manager or Service Supervisor, young executive type thoroughly experienced in domestic and commercial installation and maintenance, also in the reconditioning of used refrigerators. Now employed by eastern utility but desires to make a change. Best of references for further information. Box 765, Electric Refrigeration News.

EQUIPMENT FOR SALE

REFRIGERATOR DEALERS! Make money with Federal's reconditioned refrigerators. Approximately 1,000 nationally advertised refrigerators such as Frigidaire, G.E., Kelvinator, etc., completely remanufactured and rebuilt in our shops, the finest in the United States. Priced at $30. F.O.B. Federal Refrigerator Corp., 57 E. 25th St., New York City.

DEALERS AND SERVICEMEN. Used refrigerators "As Is". Recondition, spray them yourself, save money. Kelvinators $19.00, Frigidaires $25.00, Copelands $21.50, Servels $19.00. General Electric, Mayflower, Electrolux, others. Frigidaire two-cylinder ¼-h.p. units, with 2-tray float evaporators $19.00 each. Pilgrim Refrigeration Co., 43-47 39th Place, Long Island City, N. Y.

CABINETS—Discontinued 1935 models—4, 5, 6 cu. ft. (net) capacities—bottom mount—high quality—attractive appearance—low prices while they last—also a limited quantity of factory seconds. Write or wire for specifications and prices stating quantity and sizes desired. Midwest Stamping & Enameling Co., Morrison, Ill.

COMPRESSORS for 4 and 5 foot cabinets $7.00 each. Box 769.

EQUIPMENT WANTED

WE ARE on the market for any quantity of used or close out commercial refrigeration equipment, condensing units, coils, air conditioning apparatus, etc. Advise by mail what you have to sell, make, model, condition, price, etc. Address Box No. 135, Madison Square Sta., New York, N. Y.

HERMETIC UNITS REPAIRED

GENERAL ELECTRIC SEALED UNITS—repaired, rebuilt, exchanged. Guaranteed service. Our modern shop is especially equipped to efficiently repair these units. Prices low and workmanship the best. Give model number when writing. Immediate service. Rex Refrigeration Service, Inc., 446 East 79th St., Chicago.

HERMETIC UNITS rebuilt or exchanged: Majestic all models $17.50, Servel $22.50, G.E. $25.00 and $32.50, other standard makes $19.50. Majestic Hermetic Dome assembly $12.50, Majestic standard compressors $6.50, thermostat or cold control exchange $2.50. Other prices on request. Six months' guarantee. Wholesale only. Refrigeration Products, Inc., 122 W. Illinois St., Chicago, Ill.

SERVICE

CHARGING VALVES FOR SEALED UNITS—Real money-making tools; you will now be able to service those refrigerators where service charges are highest. You can't afford to be without them if your living depends on service; order today; 20% deposit must accompany order (limited quantity). For G.E. (Monitor Top, etc.), $12.50; for Westinghouses, $12.50; for Gibsons, $6.50; for Bohns, $10.00; for Majestics, $6.50; for Frigidaires, $6.50. Refrigeration Research & Mfg. Co., 350 Pearl St., Brooklyn, N. Y.

ARTIFICIAL FOOD DISPLAYS

ARTIFICIAL FOOD DISPLAYS at prices you can afford to pay. A realistic food set of meats, fruits and vegetables for every make refrigerator. Complete sets from $3.00 to $6.00. Write your source of refrigerator supply or direct to Cincinnati Doll Co., 311-313 E. Twelfth St., Cincinnati, Ohio.

LARKIN COILS for... AIR CONDITIONING

TEMPRITE INSTANTANEOUS BEER and WATER COOLERS DETROIT - - MICHIGAN

VIRGINIA SMELTING CO. WEST NORFOLK VIRGINIA
EXTRA DRY ESOTOO LIQUID SULPHUR DIOXIDE V-METH-L VIRGINIA METHYL CHLORIDE
131 State St. Boston — 76 Beaver St. New York

"GENUINE DETROIT" HEATING, REFRIGERATING AND AIR CONDITIONING CONTROLS
DETROIT LUBRICATOR COMPANY DETROIT, MICHIGAN, U.S.A.
Canadian Representative—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

Questions

Ice Cream Magazines

No. 2681 (Importer, Holland)—"We beg to refer to No. 1, volume 17 of the first inst. where we find on page 15 a request under No. 2626 regarding Ice Cream Magazines. According to your answer, the following publications cover the ice cream industry: Ice Cream Field, Ice Cream Review, Ice Cream Trade Journal.

"Please let us know the name of the publisher of these magazines. Perhaps you could invite them to send us a copy so that we can judge if the subscription will be of interest to us."

Answer: Names and addresses of the publishers of the ice cream publications about which you inquire are as follows:

Ice Cream Field
I. C. F. Publishing Co., Inc.
45 W. 45th St., New York, N. Y.

Ice Cream Review
Olsen Publishing Co.
503 W. Cherry St., Milwaukee, Wis.

Ice Cream Trade Journal
Thomas D. Cutler
171 Madison Ave., New York, N. Y.

Air Conditioning Firms

No. 2682 (Manufacturer, Illinois)—"We understand that you have an up-to-date list of air-conditioning manufacturers. We are interested in obtaining this list and ask that you tell us how many are on it and the cost."

Answer: Manufacturers of both winter and summer air-conditioning equipment are listed on pages 150 through 157 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

This directory is published for the purpose of answering such questions, as it is impossible for us to prepare individual lists in answer to the thousands of requests for such information. The book is divided into four sections:

(1) alphabetic list of manufacturers; (2) index of trade names; (3) classified list of refrigeration equipment; (4) a geographical directory giving name, address, telephone number, products, and executive personnel of the various manufacturers. Also included is a separate section listing independent service companies of which we have a record, and jobbers of supplies, parts, and materials.

Majestic Service Data

No. 2683 (Dealer, New York)—"In regard to a Majestic double unit hermetically sealed, commercial refrigerator—any service information as to the cause and remedy for one of the units not freezing would be appreciated.

"The unit worked for about two weeks after a thorough cleaning, but will not now respond to the same treatment."

Answer: Information on the servicing of the Majestic Hermetic refrigerator was published in the Aug. 16, 1933, issue of ELECTRIC REFRIGERATION NEWS. Back issues of the NEWS will be sent on receipt of 10 cents per copy.

Information regarding service and replacement parts for the Majestic refrigerator can be obtained from P. L. Yates, service manager, Grigsby-Grunow Co., 5801 Dickens Ave., Chicago, Ill.

Capacitor Motors

No. 2684 (Service Man, New York)—"I am a refrigerator mechanic who is interested in finding out how a capacitor motor operates. I understand that there are no brushes in this type of motor and am curious to know what starts them.

"One of my friends told me that you have written articles for your paper, he also said that in the edition of Sept. 4, 1935, you published such an article.

"Please send me a copy of the NEWS in which this article appears."

Answer: A short description of the operation of capacitor motors appears in Chapter 7, paragraph 71, of the MASTER SERVICE MANUAL. This part of the MASTER SERVICE MANUAL was published in the Sept. 4, 1935, issue of ELECTRIC REFRIGERATION NEWS.

An article on how to service capacitor start-induction run motors used in electric refrigerators was published in the Oct. 9, 1935, issue of ELECTRIC REFRIGERATION NEWS, in which issue was published special editorial information on the servicing of motors and controls.

Sales by Counties

No. 2685 (Certified Public Accountant, New Jersey)—"We are in possession of your 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK. We have found this book very useful to us in the preparation of Income Tax matters.

"At present we have a need for information bearing upon the mechanical refrigerator unit sales that were made in the counties of Hudson and Bergen in the State of New Jersey for the period from 1930 to 1935 inclusive.

"If such information is not obtainable from your records, perhaps you might procure for us this information based upon figures covering the metropolitan district. If you do not have this information, we would appreciate very much your advice as to where we might obtain it."

Answer: Figures on the sales of electric refrigerators by counties are not available. However, a fairly accurate answer may be obtained by using certain figures given in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

You will note that on page 215 of the DATA BOOK the number of wired homes by counties for the state of New Jersey is given. Take the percentage of wired homes for the two counties to the total number of wired homes for the state as the percentage of sales of electric refrigerators for the counties to the total number of sales of refrigerators in New Jersey. Figures on the sales of refrigerators for the whole state are given on page 63.

Industry Sales Figures

No. 2686 (Manufacturer, New Jersey)—"We recently bought one of your REFRIGERATION AND AIR CONDITIONING DIRECTORIES.

"We are preparing to market an ice cube ejector for use in household refrigerator units and, being new in the field, we would like very much to have some fairly definite information as to the number of units manufactured for the latest available year for the eight or 10 largest manufacturers."

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK presents all known statistical facts about the refrigeration and air-conditioning industries, including an analysis of the market and a survey of distributive channels. Total sales of the manufacturers by years are given both in units and dollar volume for the years 1920 through 1934. The MARKET DATA BOOK sells for $3.00 per copy postpaid.

An estimate of sales of household refrigerators during 1935 was published on page 1 of the Feb. 5 issue of ELECTRIC REFRIGERATION NEWS. We do not have any data on sales by the individual manufacturers, as this is not made public.

City Sales Figures

No. 2687 (University Instructor, Illinois)—"During the last year I believe that I have seen figures published which give the refrigerator sales by cities. However, now that they are needed, I can not locate such lists.

"I am finishing a doctor's thesis on the *joint* effect of rate adjustments and appliance promotional activities on consumer demand (residential). The major part of my work has to do with the changes in demand of the 98 cities of 50 to 100,000 population, although several other cities have been added in order to include all states.

"The increase in usage of mechanical refrigerators should be shown in case figures have been collected and I feel that if such figures are available you will know about them.

"Should you have this information available but not separated, I will be glad to pay for stenographic expense to cover such work; or, in case it is more convenient to photograph it, I will be glad to arrange for that.

"Any information that you can give me will be greatly appreciated."

Answer: All available statistical information and sales records of the refrigeration industry are published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK. Sales are not broken down by cities, however, in the official tabulation.

In the DATA BOOK there are figures on sales in 22 cities taken from a survey compiled by the R. L. Polk Co.

The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

KOCH COMMERCIAL REFRIGERATOR CABINETS
All types and sizes of heavily insulated refrigerators and display cases.
WANTED— DISTRIBUTORS and SALES AGENTS
Attractive sales proposition. Some good territories available. Many exclusive features. Write for information, and submit your qualifications.
KOCH REFRIGERATORS, North Kansas City, Mo.

3600 Line of Display Cases—
These cases afford more square feet of display space than many other cases considerably larger. Two sizes are available—14 and 19½ square feet of display—and you have your choice of Porcelain or DuLux finish.
Among the features are extra large rubber composition sliding doors; extra height doors for storage department, full view of illuminated display section; removable intermediate shelf, and 3" approved insulation.
For real convenience, economy, room and accessibility these cases cannot be equaled. Sold only through Dealers and Jobbers.
Write for complete catalog information
GLOEKLER MANUFACTURING COMPANY
429 Fourth Avenue, Pittsburgh, Pa.

STEELCRAFT REFRIGERATOR CABINETS
WE MANUFACTURE DISTINCTIVE FOUR AND SIX CU. FT. MODELS
WRITE, WIRE, OR PHONE FOR PRICES
STEELCRAFT INDUSTRIES, INC.
4851 SPRING GROVE AVE.
CINCINNATI, OHIO

SILVER PISTON RINGS SEAL
THE ONLY PISTON RING DESIGNED & DEVELOPED Exclusively for Refrigeration
The Ring with a bearing face. A Bearing for the ring against the cylinder wall.
Longer Life
Less Friction
Better Seal
No Scuffing
Burnishing Cylinder
DEALERS — JOBBERS — SERVICE MEN
Write for Details
SKINNER CHUCK CO., 340 Church Street, NEW BRITAIN, CONN.

HENRY TUBE CUTTER WITH STEEL ROLLERS IN TUBE SUPPORT
Patents Pending
FOR HARD DRAWN COPPER PIPE
A tube cutter that's in a class by itself! Friction is reduced by the steel rollers. Very sturdy. Easy hand grip assures continuous feed of cutter wheel. Replaceable reamer and cutter wheel.
No. 10 for 3/16" to ¾" o.d. inc.... $2.20
No. 20 for ½" to 1⅜" o.d. inc.... 2.75
No. 30 for 1" to 2⅛" o.d. inc.... 3.75
HENRY VALVE CO.
1001-19 N. Spaulding Ave., Chicago, Ill.
IF YOUR JOBBER CAN'T SUPPLY YOU, ORDER DIRECT

BOUND VOLUMES

Each of the following volumes contains all weekly issues of Electric Refrigeration News issued during a period of four months. Stiff paper board covers.

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Vol. 9—May 3 to Aug. 30, 1933.	(Serial Nos. 215 to 232.)
Vol. 10—Sept. 6 to Dec. 27, 1933.	(Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934.	(Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934.	(Serial Nos. 267 to 284.)
Vol. 13—Sept. 5 to Dec. 26, 1934.	(Serial Nos. 285 to 301.)
Vol. 14—Jan. 2 to April 24, 1935.	(Serial Nos. 302 to 318.)
Vol. 15—May 1 to Aug. 28, 1935.	(Serial Nos. 319 to 336.)
Vol. 16—Sept. 4 to Dec. 25, 1935.	(Serial Nos. 337 to 353.)

Price $3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

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